Received 1-October-2003

IODP Proposal Cover Sheet

603-CDP3

☐ **New** ☑ **Revised** ☐ **Addendum**

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Title:	**NanTroSEIZE: The Nankai Trough Seismogenic Zone Experiment Complex Drilling Project**		
Proponent(s):	**Gaku Kimura, Harold Tobin, and the NanTroSEIZE Working Group (24 Co-Proponents)**		
Keywords: *(5 or less)*	**Seismogenic zone, earthquakes, tsunamigenesis, fault mechanics**	Area:	**Southwest Japan margin**

Contact Information:

Contact Person:	**Harold Tobin**		
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Permission to post abstract on iSAS Web site: ☑ Yes ☐ No

Abstract: (*400 words or less)*

This Complex Drilling Project (CDP) proposal describes the rationale and scientific objectives for an integrated program of geophysical and geologic studies, non-riser drilling, and riser drilling designed to investigate the aseismic to seismic transition of the megathrust system and the processes of earthquake and tsunami generation at the Nankai Trough subduction zone. **Our fundamental goal is the creation of a distributed observatory spanning the up-dip limit of seismogenic and tsunamigenic behavior.** This will involve sampling and instrumenting key elements of the active plate boundary fault system at several locations off the Kii Peninsula, where the plate interface and active mega-splay faults – implicated in tsunamigenesis – are accessible to drilling within the region of coseismic rupture in the 1944 Tonankai M8 great earthquake. The most ambitious objective is to access and instrument the Nankai plate interface within the seismogenic zone to advance our knowledge of fundamental aseismic and seismic faulting processes and controls on the transition between them. The strategy of NanTroSEIZE differs fundamentally from that of other proposed deep fault drilling programs because we will document the evolution of fault zone properties by trading time for space along the dipping plate boundary.

We propose 3 distinct phased IODP drilling efforts: **Phase 1** – *Inputs to the seismogenic zone system*, investigating variations in the sediments, oceanic crust, and fluids input to the plate boundary system; **Phase 2** – *Mega-splay (OOST) fault drilling* to sample and instrument thrusts which splay from the basal décollement up through the forearc, in order to characterize fault properties transecting the aseismic to seismic transition from 1 to 3.5 km depth shallow; and **Phase 3** – *Sampling and instrumenting the plate interface* (décollement) at ~ 6 km below seafloor, in a region predicted to be within both the zone capable of generating seismogenic behavior and in the zone of co-seismic slip in the 1944 great earthquake. Long-term monitoring of a wide range of phenomena will be a major part of the effort, to detect signals of fault zone processes in the near-field. In addition, ongoing seismological and geodetic arrays in the vicinity as well as in the deep boreholes, geologic studies, laboratory and modeling efforts are all integral components of the NanTroSEIZE project, essential to success in achieving project objectives.

603-CDP3

Scientific Objectives: (*250 words or less*)

The principal scientific objective of the proposed drilling is to acquire data bearing on and testing the following key hypotheses:

1. Systematic, progressive material and state changes control the onset of seismogenic behavior on subduction thrusts.

2. Subduction zone megathrusts are weak faults.

3. Within the seismogenic zone, relative plate motion is primarily accommodated by coseismic frictional slip in a concentrated zone.

4. Physical properties, chemistry, and state of the fault zone change with time during the earthquake cycle.

5. The mega-splay (OOST) thrust fault system slips in discrete events which may include tsunamigenic slip during great earthquakes.

Proposed **NanTroSEIZE** efforts will test models for the frictional behavior of fault rocks across the aseismic – seismogenic transition, the composition of faults and fluids and associated pore pressure and state of stress, partitioning of strain spatially between basal interface and splays, temporally between coseismic and interseismic periods, and between infraseismic and aseismic events vs. seismic events. Long-term borehole observations potentially ultimately will test whether interseismic variations or detectable precursory phenomena exist prior to great subduction earthquakes.

Please describe below any non-standard measurements technology needed to achieve the proposed scientific objectives.

In various combinations, the following non-standard measurements are desired for sites covered by this CDP:

During Drilling and Casing Installation: Logging/measurement while drilling, drill stem & wireline pressure/permeability tests, cross-hole hydrologic tests, offset/walkaway vertical seismic profiling, cross-hole seismic.

Long-Term Borehole Observatory Monitoring: Array temperature measurement, pressure measurement in packer-isolated intervals, array measurement for short-period, three-component seismometry, bottom-hole broadband and strong motion seismometry, bottom hole strain, multi-level tilt, and long-term fluid collection for biological and geochemical measurements. Many of these measurements will need to be made at temperatures of ~ 80 – 150+ C.

Proposed Sites:

SEE INDIVIDUAL PROPOSALS FOR EACH PHASE FOR SITE DESCRIPTIONS

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IODP Proposal Cover Sheet

603-Add2

☐ **New** ☐ **Revised** ■ **Addendum**

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Title:	**603-Add2, NanTroSEIZE Proposal 603 Addendum. Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation**		
Proponent(s):	Lisa McNeill (Southampton), Greg Moore (IFREE-JAMSTEC), Harold Tobin (U. Wisconsin), Masataka Kinoshita (IFREE-JAMSTEC), Casey Moore (UC Santa Cruz), Mike Underwood U. (Missouri), Gaku Kimura (Tokyo Univ.)		
Keywords: *(5 or less)*	Seismogenic zone, earthquakes, tsunamigenesis, megasplay fault activity, fault mechanics	Area:	Nankai Trough, Japan

Contact Information:

Contact Person:	Lisa McNeill		
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Permission to post abstract on IODP-MI Web site: ■ Yes ☐ No

Abstract: (*400 words or less)*

We are requesting to add two additional sites to our list of contingency sites for NanTroSEIZE drilling during Stage 1. These two sites could be cored with APC/XCB (or HPCS/ESCS) during any of the 3 scheduled expeditions on either *Chikyu* or *JR*. The cores are designed to provide detailed age control on slope sediment that overlies the tips of the mega-splay fault system offshore Kii Peninsula. The new 3D seismic data volume images these sediments in greater detail than was previously available and we are able to choose key sites to date the most recent movement along the splay faults. The near-surface displacement history of these faults is key to understanding the timing and development of the splay system.

603-Add2

Scientific Objectives: (*250 words or less*)

The objective of these two additional holes is to date the movement along the mega-splay system in the NanTroSEIZE drilling area.

Please describe below any non-standard measurements technology needed to achieve the proposed scientific objectives.

None

Proposed Sites:

Site Name	Position	Water Depth (m)	Penetration (m)			Brief Site-specific Objectives
			Sed	Bsm	Total	
NT2-05 A	33°12.433'N 136°43.867'E	2827	255	0	255	Core and date younger slope basin sediments to constrain splay fault activity
NT2-10 A	33°12.830'N 136°43.600'E	2702	325	0	325	Core and date older slope basin sediments (underlying prominent unconformity) to constrain splay fault activity

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603A-Full2

☐ **New** ☑ **Revised** ☐ **Addendum**

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Title:	**NanTroSEIZE Reference Sites: Sampling and Measuring Inputs to the Seismogenic Zone**
Proponent(s):	Michael Underwood, Juichiro Ashi, Wonn Soh, Julia Morgan, Saneatsu Saito, Demian Saffer, Elizabeth Screaton, Masataka Kinoshita, Gregory Moore, Miriam Kastner, Susan Bilek, Kohtaro Ujiie
Keywords: *(5 or less)*	Subduction inputs; physical and chemical hydrology; lithostratigraphy; structural geology; heat flow and diagenesis
Area:	Nankai Trough, Shikoku Basin

Contact Information:

Contact Person:	Michael Underwood		
Department:	Department of Geological Sciences		
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Permission to post abstract on iSAS Web site: **X** Yes ☐ No

Abstract: (*400 words or less)*

A foremost goal of IODP is to drill into the seismogenic zone of a plate-boundary fault. The CDP proposal for NanTroSEIZE (Nankai Trough Seismogenic Zone Experiment) identifies several phases or milestones in pursuit of that goal. Phase 1, the shallow reference sites, will test five fundamental hypotheses: (1) Systematic and progressive changes in material properties and state control the onset of seismogenic behavior and locking of subduction thrusts. (2) Subduction zone megathrusts are weak faults; that is, they slip under conditions of low resolved shear stress. (3) Within the seismogenic zone, relative plate motion is accommodated primarily by coseismic frictional slip in a concentrated zone. (4) Out-of-sequence (or splay) faults develop where the plate-boundary fault is strong relative to adjacent zones without splay faults. (5) The plate-boundary fault, near its up-dip limit of seismicity, follows the interface between underthrust metasedimentary rocks and igneous basement.

Reference sites serve three vital roles in testing these hypotheses. First, they establish, prior to subduction, how lithology, deformation features, hydrologic properties (porosity, permeability), variables of state (stress, pore pressure, temperature) and *in situ* properties (mineral and fluid composition, alteration, grain fabric, strain rate, microseismicity) change from a basement high (potential asperity) to a basement plain. Second, after showing how basement topography affects stratigraphy and hydrology (and, therefore, mechanical properties), we will separate those inherited variables from changes superimposed by diagenesis, deformation, and fluid flow along the P-T path of subduction. Third, to track fault-zone evolution toward stick-slip behavior, we need to begin characterizing the plate-boundary fault where it is shallow and aseismic, then move down dip (with deep drilling) into the seismogenic zone.

Data from previous DSDP-ODP legs cannot be imported to the Kii-Kumano region because stratigraphic, thermal, and hydrologic inputs to Nankai Trough change so much along strike. Drilling two reference sites within the Shikoku Basin will quantify initial conditions and show how basement relief influences the pre-subduction geometry of sedimentary facies, temperature, permeability, sediment and basement alteration, and fluid flow. A third reference site at the toe of the accretionary prism will show early-phase deformation and verify how strata get partitioned above and below the frontal decollement. The prism-toe site, moreover, will add a third dimension to constraints on facies architecture, hydrogeology, thermal structure, and reaction progress where rocks first enter the subduction zone.

603A-Full2

Scientific Objectives: (*250 words or less*)

The overarching goal of this proposed investigation is to show how the primary geologic differences between subducting basement plains and basement highs (potential asperities for earthquakes) modulate the plate boundary's mechanical properties, relative strength, and earthquake rupture properties in the down-dip direction. To begin this assessment, we propose two reference sites seaward of the trench. This pairing of sites in Shikoku Basin will capture the end-member cause-and-effect of sand-rich versus sand-poor strata in the lower part of the section and show whether or not basement hydrology and alteration history vary significantly in response to basement topography. Drilling a third site through the frontal decollement into basement will be a challenge because total sediment thickness at the prism toe is ~1750 m. Such a site is essential, however, to verify the location of structural partitioning by the fault, as well as to identify early products of fault-related deformation and fluid flow. The only way to document three-dimensional heterogeneities in hydrologic, compositional, thermal, and mechanical inputs is to integrate the following methods and tools at each site: (1) continuous coring, with penetration into at least 100 m of igneous basement; (2) complete suites of LWD logs for core-log-seismic integration and mapping; (3) lab tests of sediment composition, diagenesis, geotechnical properties, and hydrologic properties; (4) wireline hydrologic tests of *in situ* permeability (packer, pump, etc.); (5) high-resolution borehole measurements of temperature, pore pressure, and seismic velocity; and (6) chemical analysis of pore fluids, including fluids extracted from igneous basement.

Proposed Sites: (Only High Priority Sites are listed here.)

Site Name	Position	Water Depth (m)	Penetration (m)			Brief Site-specific Objectives
			Sed	Bsm	Total	
NT1-01A	Lat: 32° 44.8878' N Long: 136° 55.0236' E	3540	460 m	100 m	560 m	Comprehensive characterization of Shikoku Basin strata and upper igneous crust above basement high (coring, downhole measurements, logging)
NT1-02A	Lat: 32° 47.4996' N Long: 137° 55.0236' E	4210	730 m	100 m	830 m	Comprehensive characterization of Shikoku Basin strata and upper igneous crust above basement plain (coring, downhole measurements, logging)
NT1-03A	Lat: 33° 1.23258' N Long: 136° 47.9485' E	4125	1740 m	10 m	1750 m	Comprehensive characterization of deformation, structural partitioning by decollement, diagenesis, and fluid flow at toe of Nankai accretionary prism (coring, downhole measurements, logging)

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IODP Proposal Cover Sheet

603B-Full2

☐ **New** ☑ **Revised** ☐ **Addendum**

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Above For Official Use Only

Title:	NanTroSEIZE Drilling and Observatory Phase 2 Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation		
Proponent(s):	Masataka Kinoshita, Kevin Brown, Demian Saffer, Pierre Henry, Fred Chester, Tadanori Goto, Sean P. S. Gulick, Tetsuro Hirono, Hisao Ito, Aitaro Kato, Gaku Kimura, Achim Kopf, Gregory Moore, J. Casey Moore, Yasuyuki Nakamura, Jin-Oh Park, Saneatsu Saito, Susan Schwartz, Masanao Shinohara, Ralph Stephen, Harold Tobin, Kohtaro Ujiie, Urumu Tsunogai, and Makoto Yamano		
Keywords: *(5 or less)*	Seismogenic zone, splay fault, tsunamigenesis, fault mechanics, fluid flow	Area:	Southwestern Japan margin

Contact Information:

Contact Person:	Masataka Kinoshita		
Department:	Deep-sea Research Department		
Organization:	Japan Marine Science and Technology Center		
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E-mail:	masa@jamstec.go.jp		

Permission to post abstract on iSAS Web site: ☑ Yes ☐ No

Abstract: (*400 words or less)*

The principal goal of NanTroSEIZE is to understand the mechanics of seismogenesis and rupture propagation along subduction plate boundary faults as stated in the accompanying CDP. At Nankai, large out-of-sequence-thrust faults ("mega-splays") that branch from the décollement are common, first order structural elements of the margin and appear continuous for several 10's of km along strike. These faults offset recent slope basin sediments, are characterized by seafloor scarps, and are commonly associated with active fluid venting. Off the Kii peninsula, such a mega-splay lies within the 1944 Tonankai coseismic rupture area estimated from tsunami and seismic waveform inversions; inversions cannot distinguish splay fault slip from décollement slip. Accordingly, both the décollement zone and the splay fault system represent necessary primary fault targets to address seismogenic zone processes.

The goal of this proposal is to (1) characterize the magnitude and nature of strain accumulation and slip along mega-splays off the Kii peninsula, and (2) sample and instrument the mega-splay fault system at a range of P-T conditions from ~1-3.5 km bsf. Specifically, this proposal is aimed at testing 5 key hypotheses: (1) The mega-splay is a significant locus of plate boundary slip, slips in seismogenic events, and is currently locked; (2) The mega-splay is part of a weak plate boundary fault system and slips at low resolved shear stress; (3) Changes in physical and chemical properties of the fault zone with increasing temperature and pressure cause slip along the mega-splay to undergo a transition from aseismic to seismic slip; (4) The mega-splay is hydrologically connected to the seismogenic décollement zone at great depths impacting its mechanical and chemical state, and (5) Physical properties, chemistry, and state of the fault zone change systematically during the interseismic period.

Proposed drilling includes (1) coring of 1 site in the Kumano Basin, focused on characterizing the tectonic history of the plate above the mega-splay faults, and (2) intersection of the active mega-splay fault system at three depths from ~1 to ~3.5 km bsf (down dip evolutionary studies). We propose installation of long-term borehole monitoring instruments at several of the sites. These borehole observatories, along with surface arrays of measurements, regional geodetic and seismic monitoring both on land and via offshore cabled observatories, will provide critical data toward understanding the slip distribution, temporal nature, and controlling mechanisms of seismogenic faulting along the plate boundary system.

603B-Full2

Scientific Objectives: (*250 words or less*)

To test the five principal hypotheses (above), 5 holes will be drilled utilizing a dense net work of 2D and 3D seismic reflection data. Comprehensive programs of coring, logging and downhole measurements will target the in-situ mega-splay and wall-rock structural architecture, fault properties, stress state, fluid pressure, and temperature. Post-drilling laboratory studies will include the fluid chemistry, veining/diagenesis, mechanical properties, and fault micro-fabric relationships. NT2 sites 1 through 3 will target the mega-splay fault at depths between ~ 1 and 3.5 km. They will assess evolutionary changes in all the various parameters over a temperature range of 20°C through ~100+ °C (Hypotheses 2 and 3). In addition, at NT2-01A and B sites (1km sites), closely-spaced, paired holes will allow extensive cross hole hydrologic and geophysical studies of the shallow fault-zone. Ultimately the 3.5 km site. NT2-3, will also be used for similar cross hole studies during the Phase 3 program. These cross hole tests, together with the fluid chemistry and vein studies, will constrain the down dip hydrologic connectivity of the fault system (Hypothesis 4). The NT2-04 site in the Kumano Basin, together with additional geological investigations along the splays fault traces, will allow us to constrain the mega-splays faulting activity (Hypothesis 1). At a minimum, Sites NT2-01A and NT2-03A will be instrumented for studies of the fault locking patterns (geodetic measurements), and long-term interactions of pore pressure, temperature, tilt and strain, seism city, fluid chemistry, and electrical properties during this interseismic period.

Please describe below any non-standard measurements technology needed to achieve the proposed scientific objectives.

LWD (RAB), DVTP-P, hydrofracturing test (wireline packer test), VSP.
Geodetic (strain/tilt), seismic and hydrologic (P,T) sensors and osmotic sampler are installed for a long-term borehole observatory at NT2-03A. Cross-well hydrologic (pumping / fluid injection test) and electrical propertiers experimentsare planned at NT2-01A and B.

Proposed Sites:

Site Name	Position	Water Depth (m)	Penetration (m)			Brief Site-specific Objectives
			Sed	Bsm	Total	
NT2-01A NT2-01B	33°13.0'N, 136°41.4'E	2470	1000	0	1000	Characterization of active splay fault and fluid flow regime by core sampling, logging, cross-hole experiments and long-term monitoring
NT2-02A	33°14.0'N, 136°40.8'E	2080	2000	0	2000	Study the progressive change in the fault properties by intersecting the splay fault at intermediate depth of 2km
NT2-03A	33°15.9'N, 136°39.5'E	2240	3500	0	3500	Study the progressive change in the fault properties by intersecting the splay fault at intermediate depth of 3.5km
NT2-04A	33°23.4'N, 136°34.6'E	1990	1400	300	1700	Total history of the splay fault through continuous coring the Kumano basin sediments and pilot drilling for riser platform
NT2-06A,B	33°06.6'N, 136°31.3'E	2990	1000	0	1000	Alternate site for NT2-01A,B
NT2-07A	33°08.6'N, 136°30.0'E	2260	2000	0	2000	Alternate site for NT2-02A
NT2-08A	33°10.8'N, 136°28.6'E	2170	3500	0	3500	Alternate site for NT2-03A

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IODP Proposal Cover Sheet

603B-Full2

☐ **New** ☑ **Revised** ☐ **Addendum**

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Proponent(s):	Masataka Kinoshita, Kevin Brown, Demian Saffer, Pierre Henry, Fred Chester, Tadanori Goto, Sean P. S. Gulick, Tetsuro Hirono, Hisao Ito, Aitaro Kato, Gaku Kimura, Achim Kopf, Gregory Moore, J. Casey Moore, Yasuyuki Nakamura, Jin-Oh Park, Saneatsu Saito, Susan Schwartz, Masanao Shinohara, Ralph Stephen, Harold Tobin, Kohtaro Ujiie, Urumu Tsunogai, and Makoto Yamano
Keywords: *(5 or less)*	Seismogenic zone, splay fault, tsunamigenesis, fault mechanics, fluid flow
Area:	Southwestern Japan margin

Contact Information:

Contact Person:	Masataka Kinoshita		
Department:	Deep-sea Research Department		
Organization:	Japan Marine Science and Technology Center		
Address	2-15 Natsushima, Yokosuka 237-0061 JAPAN		
Tel.:	+81-46-867-9323	Fax:	+81-46-867-9315
E-mail:	masa@jamstec.go.jp		

Permission to post abstract on iSAS Web site: ☑ Yes ☐ No

Abstract: (*400 words or less)*

The principal goal of NanTroSEIZE is to understand the mechanics of seismogenesis and rupture propagation along subduction plate boundary faults as stated in the accompanying CDP. At Nankai, large out-of-sequence-thrust faults (“mega-splays") that branch from the décollement are common, first order structural elements of the margin and appear continuous for several 10's of km along strike. These faults offset recent slope basin sediments, are characterized by seafloor scarps, and are commonly associated with active fluid venting. Off the Kii peninsula, such a mega-splay lies within the 1944 Tonankai coseismic rupture area estimated from tsunami and seismic waveform inversions; inversions cannot distinguish splay fault slip from décollement slip. Accordingly, both the décollement zone and the splay fault system represent necessary primary fault targets to address seismogenic zone processes.

The goal of this proposal is to (1) characterize the magnitude and nature of strain accumulation and slip along mega-splays off the Kii peninsula, and (2) sample and instrument the mega-splay fault system at a range of P-T conditions from ~1-3.5 km bsf. Specifically, this proposal is aimed at testing 5 key hypotheses: (1) The mega-splay is a significant locus of plate boundary slip, slips in seismogenic events, and is currently locked; (2) The mega-splay is part of a weak plate boundary fault system and slips at low resolved shear stress; (3) Changes in physical and chemical properties of the fault zone with increasing temperature and pressure cause slip along the mega-splay to undergo a transition from aseismic to seismic slip; (4) The mega-splay is hydrologically connected to the seismogenic décollement zone at great depths impacting its mechanical and chemical state, and (5) Physical properties, chemistry, and state of the fault zone change systematically during the interseismic period.

Proposed drilling includes (1) coring of 1 site in the Kumano Basin, focused on characterizing the tectonic history of the plate above the mega-splay faults, and (2) intersection of the active mega-splay fault system at three depths from ~1 to ~3.5 km bsf (down dip evolutionary studies). We propose installation of long-term borehole monitoring instruments at several of the sites. These borehole observatories, along with surface arrays of measurements, regional geodetic and seismic monitoring both on land and via offshore cabled observatories, will provide critical data toward understanding the slip distribution, temporal nature, and controlling mechanisms of seismogenic faulting along the plate boundary system.

603B-Full2

Scientific Objectives: (*250 words or less*)

To test the five principal hypotheses (above), 5 holes will be drilled utilizing a dense net work of 2D and 3D seismic reflection data. Comprehensive programs of coring, logging and downhole measurements will target the in-situ mega-splay and wall-rock structural architecture, fault properties, stress state, fluid pressure, and temperature. Post-drilling laboratory studies will include the fluid chemistry, veining/diagenesis, mechanical properties, and fault micro-fabric relationships. NT2 sites 1 through 3 will target the mega-splay fault at depths between ~ 1 and 3.5 km. They will assess evolutionary changes in all the various parameters over a temperature range of 20°C through ~100+ °C (Hypotheses 2 and 3). In addition, at NT2-01A and B sites (1km sites), closely-spaced, paired holes will allow extensive cross hole hydrologic and geophysical studies of the shallow fault-zone. Ultimately the 3.5 km site. NT2-3, will also be used for similar cross hole studies during the Phase 3 program. These cross hole tests, together with the fluid chemistry and vein studies, will constrain the down dip hydrologic connectivity of the fault system (Hypothesis 4). The NT2-04 site in the Kumano Basin, together with additional geological investigations along the splays fault traces, will allow us to constrain the mega-splays faulting activity (Hypothesis 1). At a minimum, Sites NT2-01A and NT2-03A will be instrumented for studies of the fault locking patterns (geodetic measurements), and long-term interactions of pore pressure, temperature, tilt and strain, seism city, fluid chemistry, and electrical properties during this interseismic period.

Please describe below any non-standard measurements technology needed to achieve the proposed scientific objectives.

LWD (RAB), DVTP-P, hydrofracturing test (wireline packer test), VSP.
Geodetic (strain/tilt), seismic and hydrologic (P,T) sensors and osmotic sampler are installed for a long-term borehole observatory at NT2-03A. Cross-well hydrologic (pumping / fluid injection test) and electrical propertiers experimentsare planned at NT2-01A and B.

Proposed Sites:

Site Name	Position	Water Depth (m)	Penetration (m)			Brief Site-specific Objectives
			Sed	Bsm	Total	
NT2-01A NT2-01B	33°13.0'N, 136°41.4'E	2470	1000	0	1000	Characterization of active splay fault and fluid flow regime by core sampling, logging, cross-hole experiments and long-term monitoring
NT2-02A	33°14.0'N, 136°40.8'E	2080	2000	0	2000	Study the progressive change in the fault properties by intersecting the splay fault at intermediate depth of 2km
NT2-03A	33°15.9'N, 136°39.5'E	2240	3500	0	3500	Study the progressive change in the fault properties by intersecting the splay fault at intermediate depth of 3.5km
NT2-04A	33°23.4'N, 136°34.6'E	1990	1400	300	1700	Total history of the splay fault through continuous coring the Kumano basin sediments and pilot drilling for riser platform
NT2-06A,B	33°06.6'N, 136°31.3'E	2990	1000	0	1000	Alternate site for NT2-01A,B
NT2-07A	33°08.6'N, 136°30.0'E	2260	2000	0	2000	Alternate site for NT2-02A
NT2-08A	33°10.8'N, 136°28.6'E	2170	3500	0	3500	Alternate site for NT2-03A

iSAS/IODP Site Summary Forms:

Form 1 - General Site Information

603B-Full2

Please fill out information in all gray boxes

Revised 7 March 2002

New ☐ **Revised** ☑

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 2 Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation
Date Form Submitted:	Oct. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Characterization of active splay fault and fluid flow regime by core sampling, logging, cross-hole experiments and long-term monitoring. Focuses are placed on mechanical and hydrological properties (e.g. strength, pore pressure, permeability, porosity), fluid budget, origin of the fluid, detection of episodic flow. Borehole long-term observatory for hydrogeological properties is planned as well as cross-hole experiment. Priority:2
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT2-01A/B	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 13.0 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 41.4 E	Distance to Land:	45 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary:	Alt:	Water Depth:	2.470 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	1000	0
	What is the total sed. thickness? >3,000 m	

Total Penetration: 700 m

General Lithologies: Upper section of splay faults, consisting of deformed, compacted turbidite

Coring Plan: *(Specify or Circle)*

1-2-3-APC ☑ VPC* ☐ XCB ☑ MDCB* ☐ PCS ☑ RCB ☑ Re-entry ☑ HRGB ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools		Special Tools				LWD	
Neutron-Porosity	☑	Borehole Televiewer	☐	Formation Fluid Sampling	☐	Density-Neutron	☑
Litho-Density	☑	Nuclear Magnetic Resonance	☑	Borehole Temperature & Pressure	☑	Resistivity-Gamma Ray	☑
Gamma Ray	☑	Geochemical	☐	Borehole Seismic	☐	Acoustic	☐
Resistivity	☑	Side-Wall Core Sampling	☐				
Acoustic	☐						
Formation Image	☑			Others ( )		Others (FMI)	

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 20 °C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from 200 m to 300 m, 5 m intervals

from 700 m to 900 m, 5 m intervals

Basic Sampling Intervals: 5m

Estimated days:

Drilling/Coring: 15	Logging: 5	Total On-Site: 40

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Geodetic (strain/tilt), seismic and hydrologic (P,T) sensors with casing (20 days)

Cross-hole experiments (5 days)

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas	☐	Complicated Seabed Condition	☐	Hydrothermal Activity	☐	*What is your Weather window? (Preferable period with the reasons)*
Hydrocarbon	☐	Soft Seabed	☐	Landslide and Turbidity Current	☐	May – August (typhoon risk in late August to September, then low pressure in November through March)
Shallow Water Flow	☐	Currents	☑	Methane Hydrate	☑	
Abnormal Pressure	☐	Fractured Zone	☐	Diapir and Mud Volcano	☐	
Man-made Objects	☑	Fault	☑	High Temperature	☐	
H_2S	☐	High Dip Angle	☐	Ice Conditions	☐	
CO_2	☐					

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

roposal #:	Site #: NT2-01A/B	Date Form Submitted: Oct. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-I (Feb. 2003) Crossing Lines(s): JAMSTEC Line-9 (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-4 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and migration velocity from MCS lines. OBS data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-erm monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity			Being processed now
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-01A/B	Date Form Submitted: Oct. 1, 2003
Water Depth (m): 2470	Sed. Penetration (m): 1000	Basement Penetration (m): 0

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ☑

Are high temperatures expected at this site? Yes ☐ No ☑

Are there any other special requirements for logging at this site? Yes ☐ No ☑

If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic		
FMS	Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	Cross-hole hydrologic and electrical experiment. RAB Hydrofracturing, Packer injection test CORK and Geodetic borehole observatory	1

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-01A/B	Date Form Submitted: Oct. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 1000 m
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct drilling in eastern Nankai in 2004. This datawill be used for ur program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	
6	What "special" precautions will be taken during drilling?	Yes, During drilling into the fault zone, hole may collapse.
7	What abandonment procedures do you plan to follow:	None
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-01A/B	Date Form Submitted: Oct. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
300 800	Unconformity fault	Holocene to Miocene	1.6-2.5km/s	Slope sediments to old accretionary rocks	Accretionary prism		

iSAS/IODP Site Summary Forms:

Form 1 - General Site Information

603B-Full2

Please fill out information in all gray boxes

Revised 7 March 2002

New ☐ Revised ☑

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 2 Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation
Date Form Submitted:	Oct. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Study the progressive change in the fault properties by intersecting the splay fault at intermediate depth of 2km. Integration with NT2-01A and NT2-03A are essential. Priority:2
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT2-02A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 14.0 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 40.8 E	Distance to Land:	45 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary:	Alt:	Water Depth:	2,080 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	2000	0
	What is the total sed. thickness? >3,000 m	
	Total Penetration:	1,700 m

General Lithologies: Slope basin sediment on top, fractured section across the splay fault, and underlying deformed, compacted turbidite

Coring Plan: *(Specify or Circle)*

1-2-3-APC ☑ VPC* ☐ XCB ☑ MDCB* ☐ PCS ☐ RCB ☑ Re-entry ☑ HRGB ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools	Special Tools		LWD
Neutron-Porosity ☑	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ☑
Litho-Density ☑	Nuclear Magnetic Resonance ☑	Borehole Temperature & Pressure ☑	Resistivity-Gamma Ray ☑
Gamma Ray ☑	Geochemical ☐	Borehole Seismic ☐	Acoustic ☐
Resistivity ☑	Side-Wall Core Sampling ☐		
Acoustic ☐			
Formation Image ☑		Others ( )	Others (FMI)

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 40-60 °C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from 300 m to 500 m, 5 m intervals

from 1700 m to 1900 m, 5 m intervals

Basic Sampling Intervals: 5m

Estimated days: Drilling/Coring: 25 | Logging: 10 | Total On-Site: 35

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐
Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐
Shallow Water Flow ☐	Currents ☑	Methane Hydrate ☑
Abnormal Pressure ☐	Fractured Zone ☐	Diapir and Mud Volcano ☐
Man-made Objects ☑	Fault ☑	High Temperature ☐
H_2S ☐	High Dip Angle ☐	Ice Conditions ☐
CO_2 ☐		

What is your Weather window? (Preferable period with the reasons)

May – August (typhoon risk in late August to September, then low pressure in November through March)

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

roposal #:	Site #: NT2-02A	Date Form Submitted: Oct. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-I (Feb. 2003) Crossing Lines(s): JAMSTEC Line-9 (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-4 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and migration velocity from MCS lines. OBS data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-erm monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity			Being processed now
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-02A	Date Form Submitted: Oct. 1, 2003
Water Depth (m): 2080	Sed. Penetration (m): 2000	Basement Penetration (m): 0

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ☑

Are high temperatures expected at this site? Yes ☐ No ☑

Are there any other special requirements for logging at this site? Yes ☐ No ☑

If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic		
FMS	Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	RAB preferred	2

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-02A	Date Form Submitted: Oct. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 2000 m
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct drilling in eastern Nankai in 2004. This datawill be used for ur program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	
6	What "special" precautions will be taken during drilling?	Yes, During drilling into the fault zone, hole may collapse.
7	What abandonment procedures do you plan to follow:	None
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-02A	Date Form Submitted: Oct. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
400 1800	Unconformity fault	Holocene to Miocene	1.6-2.5km/s	Slope sediments to old accretionary rocks	Accretionary prism		

iSAS/IODP Site Summary Forms:

603B-Full2

Form 1 - General Site Information

Please fill out information in all gray boxes

Revised 7 March 2002

New ☐ **Revised** ☑

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 2 Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation
Date Form Submitted:	Oct. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Study the progressive change in the fault properties by intersecting the splay fault at intermediate depth of 3.5km. Integration with NT2-01A and NT2-02A are essential. Priority:1
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT2-03A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 15.9 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 39.5 E	Distance to Land:	45 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary:	Alt:	Water Depth:	2,240 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	3500	0
	What is the total sed. thickness? >3,000 m	
	Total Penetration: 2,200 m	

General Lithologies: Slope basin sediment on top, fractured section across the splay fault, and underlying deformed, compacted turbidite

Coring Plan: *(Specify or Circle)*

Continuous coring may be replaced with ordinary/LWD logging.

1-2-3-APC ☑ VPC* ☐ XCB ☑ MDCB* ☐ PCS ☐ RCB ☑ Re-entry ☑ HRGB ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools		Special Tools		LWD	
Neutron-Porosity	☑	Borehole Televiewer	☐	Formation Fluid Sampling	☐	Density-Neutron	☑
Litho-Density	☑	Nuclear Magnetic Resonance	☑	Borehole Temperature & Pressure	☑	Resistivity-Gamma Ray	☑
Gamma Ray	☑	Geochemical	☐	Borehole Seismic	☐	Acoustic	☐
Resistivity	☑	Side-Wall Core Sampling	☐				
Acoustic	☐						
Formation Image	☑			Others ( )		Others (FMI)	

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 80-100 °C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from 1700 m to 1900 m, 5 m intervals

from 3300 m to 3500 m, 5 m intervals

Basic Sampling Intervals: 5m

Estimated days:

Drilling/Coring: 130	Logging: 20	Total On-Site: 250

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Geodetic (strain/tilt), seismic and hydrologic (P,T) sensors (100 days?)

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas	☐	Complicated Seabed Condition	☐	Hydrothermal Activity	☐
Hydrocarbon	☐	Soft Seabed	☐	Landslide and Turbidity Current	☐
Shallow Water Flow	☐	Currents	☑	Methane Hydrate	☑
Abnormal Pressure	☐	Fractured Zone	☐	Diapir and Mud Volcano	☐
Man-made Objects	☑	Fault	☑	High Temperature	☐
H_2S	☐	High Dip Angle	☐	Ice Conditions	☐
CO_2	☐				

What is your Weather window? (Preferable period with the reasons)

May – August (typhoon risk in late August to September, then low pressure in November through March)

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

roposal #:	Site #: NT2-03A	Date Form Submitted: Oct. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-I (Feb. 2003) Crossing Lines(s): JAMSTEC Line-9 (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-4 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and migration velocity from MCS lines. OBS data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-erm monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity			Being processed now
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-03A	Date Form Submitted: Oct. 1, 2003
Water Depth (m): 2240	Sed. Penetration (m): 3500	Basement Penetration (m): 0

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ☑

Are high temperatures expected at this site? Yes ☐ No ☑

Are there any other special requirements for logging at this site? Yes ☐ No ☑

If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic		
FMS	Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	RAB, VSP Hydrofracturing, Packer injection test CORK and Geodetic/Seismic borehole observatory	1

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-03A	Date Form Submitted: Oct. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 3500 m
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct drilling in eastern Nankai in 2004. This datawill be used for ur program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	
6	What "special" precautions will be taken during drilling?	Yes, During drilling into the fault zone, hole may collapse.
7	What abandonment procedures do you plan to follow:	None
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-03A	Date Form Submitted: Oct. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
300 1800 3400	Unconformity Fault fault	Holocene to Miocene	1.6-2.5km/s	Slope sediments to old accretionary rocks	Accretionary prism		

iSAS/IODP Site Summary Forms:

Form 1 - General Site Information

603B-Full2

Please fill out information in all gray boxes

Revised 7 March 2002

New ☐ Revised ☑

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 2 Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation
Date Form Submitted:	Oct. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Total history of the splay fault system through continuous coring the Kumano foreac basin sediments: Objective 1 is the primary target of this site. Total history of the splay fault system is depicted by integrating the results from NT1b-05A as a reference for this site. Drilling the underlying acoustic basement is planned to clarify the structure of pst accretionary complex, but is also used as a pilot drilling for the future riser-based proposal. Priority:4
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT2-04A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 23.4 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 34.6 E	Distance to Land:	37 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary:	Alt:	Water Depth:	1,990 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	1,400	300
	What is the total sed. thickness? 1,400 m	
	Total Penetration: 1,700 m	

General Lithologies: Forearc basin sediment with unconformity laying on acoustic basement of Tertially accretionary complex

Coring Plan: *(Specify or Circle)*

1-2-3-APC ☑ VPC* ☐ XCB ☑ MDCB* ☐ PCS ☐ RCB ☑ Re-entry ☐ HRGB ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools	Special Tools		LWD
Neutron-Porosity ☑	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ☐
Litho-Density ☑	Nuclear Magnetic Resonance ☑	Borehole Temperature & Pressure ☑	Resistivity-Gamma Ray ☐
Gamma Ray ☑	Geochemical ☐	Borehole Seismic ☐	Acoustic ☐
Resistivity ☑	Side-Wall Core Sampling ☐		
Acoustic ☐			
Formation Image ☑		Others ( )	Others (FMI)

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 70 °C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from _____ m to _____ m, _____ m intervals

from _____ m to _____ m, _____ m intervals

Basic Sampling Intervals: 5m

Estimated days: Drilling/Coring: 15 | Logging: 3 | Total On-Site: 18

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐
Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐
Shallow Water Flow ☐	Currents ☑	Methane Hydrate ☑
Abnormal Pressure ☐	Fractured Zone ☐	Diapir and Mud Volcano ☐
Man-made Objects ☑	Fault ☑	High Temperature ☐
H_2S ☐	High Dip Angle ☐	Ice Conditions ☐
CO_2 ☐		

What is your Weather window? (Preferable period with the reasons)

May – August (typhoon risk in late August to September, then low pressure in November through March)

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

roposal #:	Site #: NT2-04A	Date Form Submitted: Oct. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-I (Feb. 2003) Crossing Lines(s): JAMSTEC Line (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-4 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and migration velocity from MCS lines. OBS data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-erm monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity			Being processed now
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ☑ *Revised* ☐

Proposal #:	Site #: NT2-04A	Date Form Submitted: Oct. 1, 2003
Water Depth (m): 1990	Sed. Penetration (m): 1400	Basement Penetration (m): 300

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ☑

Are high temperatures expected at this site? Yes ☐ No ☑

Are there any other special requirements for logging at this site? Yes ☐ No ☑

If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic		
FMS	Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)	.	
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP		

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-04A	Date Form Submitted: Oct. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 1700 m
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct drilling in eastern Nankai in 2004. This datawill be used for ur program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	
6	What "special" precautions will be taken during drilling?	Yes, During drilling into the fault zone, hole may collapse.
7	What abandonment procedures do you plan to follow:	None
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-04A	Date Form Submitted: Oct. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
1400	Unconformity	Holocene to late Tertiary	1.5-2.0km/s	Turbidite & hemipelagic sediments	Forearc basin		Fan deposits?

iSAS/IODP Site Summary Forms:

Form 1 - General Site Information

603B-Full2

Please fill out information in all gray boxes

Revised 7 March 2002

New ☐ **Revised** ☑

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 2 Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation
Date Form Submitted:	Oct. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Characterization of active splay fault and fluid flow regime by core sampling, logging, cross-hole experiments and long-term monitoring. Focuses are placed on mechanical and hydrological properties (e.g. strength, pore pressure, permeability, porosity), fluid budget, origin of the fluid, detection of episodic flow. Borehole long-term observatory for hydrogeological properties is planned as well as cross-hole experiment. Priority:3 (Alternate site for NT2-01A/B)
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT2-06A/B	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 06.6 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 31.3 E	Distance to Land:	45 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary:	Alt:	Water Depth:	2.990 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	1000	0
	What is the total sed. thickness? >3,000 m	

Total Penetration: 700 m

General Lithologies: Upper section of splay faults, consisting of deformed, compacted turbidite

Coring Plan: *(Specify or Circle)*

1-2-3-APC ☑ VPC* ☐ XCB ☑ MDCB* ☐ PCS ☑ RCB ☑ Re-entry ☑ HRGB ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools		Special Tools				LWD	
Neutron-Porosity	☑	Borehole Televiewer	☐	Formation Fluid Sampling	☐	Density-Neutron	☑
Litho-Density	☑	Nuclear Magnetic Resonance	☑	Borehole Temperature & Pressure	☑	Resistivity-Gamma Ray	☑
Gamma Ray	☑	Geochemical	☐	Borehole Seismic	☐	Acoustic	☐
Resistivity	☑	Side-Wall Core Sampling	☐				
Acoustic	☐						
Formation Image	☑			Others ( )		Others (FMI)	

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 20 °C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from 200 m to 300 m, 5 m intervals

from 700 m to 900 m, 5 m intervals

Basic Sampling Intervals: 5m

Estimated days:

Drilling/Coring: 15	Logging: 5	Total On-Site: 40

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Geodetic (strain/tilt), seismic and hydrologic (P,T) sensors with casing (20 days)

Cross-hole experiments (5 days)

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas	☐	Complicated Seabed Condition	☐	Hydrothermal Activity	☐	*What is your Weather window? (Preferable period with the reasons)*	
Hydrocarbon	☐	Soft Seabed	☐	Landslide and Turbidity Current	☐	May – August (typhoon risk in late August to September, then low pressure in November through March)	
Shallow Water Flow	☐	Currents	☑	Methane Hydrate	☑		
Abnormal Pressure	☐	Fractured Zone	☐	Diapir and Mud Volcano	☐		
Man-made Objects	☑	Fault	☑	High Temperature	☐		
H_2S	☐	High Dip Angle	☐	Ice Conditions	☐		
CO_2	☐						

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

roposal #:	Site #: NT2-06A/B	Date Form Submitted: Oct. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-I (Feb. 2003) Crossing Lines(s): JAMSTEC Line-9 (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-4 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and migration velocity from MCS lines. OBS data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-erm monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity			Being processed now
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-06A/B	Date Form Submitted: Oct. 1, 2003
Water Depth (m): 2990	Sed. Penetration (m): 1000	Basement Penetration (m): 0

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ☑

Are high temperatures expected at this site? Yes ☐ No ☑

Are there any other special requirements for logging at this site? Yes ☐ No ☑

If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic		
FMS	Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	Cross-hole hydrologic and electrical experiment. RAB Hydrofracturing, Packer injection test CORK and Geodetic borehole observatory	1

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-06A/B	Date Form Submitted: Oct. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 1000 m
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct drilling in eastern Nankai in 2004. This datawill be used for ur program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	
6	What "special" precautions will be taken during drilling?	Yes, During drilling into the fault zone, hole may collapse.
7	What abandonment procedures do you plan to follow:	None
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-06A/B	Date Form Submitted: Oct. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
300 800	Unconformity fault	Holocene to Miocene	1.6-2.5km/s	Slope sediments to old accretionary rocks	Accretionary prism		

iSAS/IODP Site Summary Forms:

Form 1 - General Site Information

603B-Full2

Please fill out information in all gray boxes

Revised 7 March 2002

New ☐ **Revised** ☑

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 2 Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation
Date Form Submitted:	Oct. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Study the progressive change in the fault properties by intersecting the splay fault at intermediate depth of 2km. Integration with NT2-01A and NT2-03A are essential. Priority:2 (Alternate site for NT2-02A)
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT2-07A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 08.6 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 30.0 E	Distance to Land:	45 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary:	Alt:	Water Depth:	2,260 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	2000	0
	What is the total sed. thickness? >3,000 m	
	Total Penetration: 1,700 m	

General Lithologies: Slope basin sediment on top, fractured section across the splay fault, and underlying deformed, compacted turbidite

Coring Plan: *(Specify or Circle)*

1-2-3-APC ☑ VPC* ☐ XCB ☑ MDCB* ☐ PCS ☐ RCB ☑ Re-entry ☑ HRGB ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools	Special Tools		LWD
Neutron-Porosity ☑	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ☑
Litho-Density ☑	Nuclear Magnetic Resonance ☑	Borehole Temperature & Pressure ☑	Resistivity-Gamma Ray ☑
Gamma Ray ☑	Geochemical ☐	Borehole Seismic ☐	Acoustic ☐
Resistivity ☑	Side-Wall Core Sampling ☐		
Acoustic ☐			
Formation Image ☑		Others ( )	Others (FMI)

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 40-60 °C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from 300 m to 500 m, 5 m intervals

from 1700 m to 1900 m, 5 m intervals

Basic Sampling Intervals: 5m

Estimated days: Drilling/Coring: 25 | Logging: 10 | Total On-Site: 35

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐
Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐
Shallow Water Flow ☐	Currents ☑	Methane Hydrate ☑
Abnormal Pressure ☐	Fractured Zone ☐	Diapir and Mud Volcano ☐
Man-made Objects ☑	Fault ☑	High Temperature ☐
H_2S ☐	High Dip Angle ☐	Ice Conditions ☐
CO_2 ☐		

What is your Weather window? (Preferable period with the reasons)

May – August (typhoon risk in late August to September, then low pressure in November through March)

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

roposal #:	Site #: NT2-07A	Date Form Submitted: Oct. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-I (Feb. 2003) Crossing Lines(s): JAMSTEC Line-9 (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-4 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and migration velocity from MCS lines. OBS data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-erm monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity			Being processed now
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-07A	Date Form Submitted: Oct. 1, 2003
Water Depth (m): 2260	Sed. Penetration (m): 2000	Basement Penetration (m): 0

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ☑

Are high temperatures expected at this site? Yes ☐ No ☑

Are there any other special requirements for logging at this site? Yes ☐ No ☑

If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic		
FMS	Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	RAB preferred	2

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-07A	Date Form Submitted: Oct. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 2000 m
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct drilling in eastern Nankai in 2004. This datawill be used for ur program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	
6	What "special" precautions will be taken during drilling?	Yes, During drilling into the fault zone, hole may collapse.
7	What abandonment procedures do you plan to follow:	None
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-07A	Date Form Submitted: Oct. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
400 1800	Unconformity fault	Holocene to Miocene	1.6-2.5km/s	Slope sediments to old accretionary rocks	Accretionary prism		

iSAS/IODP Site Summary Forms:

603B-Full2

Form 1 - General Site Information

Please fill out information in all gray boxes

Revised 7 March 2002

New ☐ **Revised** ☑

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 2 Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation
Date Form Submitted:	Oct. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Study the progressive change in the fault properties by intersecting the splay fault at intermediate depth of 3.5km. Integration with NT2-01A and NT2-02A are essential. Priority:1 (Alternate site for NT2-03A)
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT2-08A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 10.8 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 28.6 E	Distance to Land:	45 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary:	Alt:	Water Depth:	2,170 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	3500	0
	What is the total sed. thickness? >3,000 m	
	Total Penetration: 2,200 m	

General Lithologies: Slope basin sediment on top, fractured section across the splay fault, and underlying deformed, compacted turbidite

Coring Plan: *(Specify or Circle)*

Continuous coring may be replaced with ordinary/LWD logging.

1-2-3-APC ☑ VPC* ☐ XCB ☑ MDCB* ☐ PCS ☐ RCB ☑ Re-entry ☑ HRGB ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools		Special Tools				LWD	
Neutron-Porosity	☑	Borehole Televiewer	☐	Formation Fluid Sampling	☐	Density-Neutron	☑
Litho-Density	☑	Nuclear Magnetic Resonance	☑	Borehole Temperature & Pressure	☑	Resistivity-Gamma Ray	☑
Gamma Ray	☑	Geochemical	☐	Borehole Seismic	☐	Acoustic	☐
Resistivity	☑	Side-Wall Core Sampling	☐				
Acoustic	☐						
Formation Image	☑			Others ( )		Others (FMI)	

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 80-100 °C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from 1700 m to 1900 m, 5 m intervals

from 3300 m to 3500 m, 5 m intervals

Basic Sampling Intervals: 5m

Estimated days:

Drilling/Coring: 130	Logging: 20	Total On-Site: 250

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Geodetic (strain/tilt), seismic and hydrologic (P,T) sensors (100 days?)

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas	☐	Complicated Seabed Condition	☐	Hydrothermal Activity	☐
Hydrocarbon	☐	Soft Seabed	☐	Landslide and Turbidity Current	☐
Shallow Water Flow	☐	Currents	☑	Methane Hydrate	☑
Abnormal Pressure	☐	Fractured Zone	☐	Diapir and Mud Volcano	☐
Man-made Objects	☑	Fault	☑	High Temperature	☐
H_2S	☐	High Dip Angle	☐	Ice Conditions	☐
CO_2	☐				

What is your Weather window? (Preferable period with the reasons)

May – August (typhoon risk in late August to September, then low pressure in November through March)

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

roposal #:	Site #: NT2-08A	Date Form Submitted: Oct. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-I (Feb. 2003) Crossing Lines(s): JAMSTEC Line-9 (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-4 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and migration velocity from MCS lines. OBS data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-erm monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity			Being processed now
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-08A	Date Form Submitted: Oct. 1, 2003
Water Depth (m): 2170	Sed. Penetration (m): 3500	Basement Penetration (m): 0

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ☑

Are high temperatures expected at this site? Yes ☐ No ☑

Are there any other special requirements for logging at this site? Yes ☐ No ☑

If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic		
FMS	Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	RAB, VSP Hydrofracturing, Packer injection test CORK and Geodetic/Seismic borehole observatory	1

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-08A	Date Form Submitted: Oct. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 3500 m
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct drilling in eastern Nankai in 2004. This datawill be used for ur program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	
6	What "special" precautions will be taken during drilling?	Yes, During drilling into the fault zone, hole may collapse.
7	What abandonment procedures do you plan to follow:	None
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-08A	Date Form Submitted: Oct. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
300 1800 3400	Unconformity Fault fault	Holocene to Miocene	1.6-2.5km/s	Slope sediments to old accretionary rocks	Accretionary prism		

Received 1 April 2004

IODP Proposal Cover Sheet

603C-Full

☑ New ☐ Revised ☐ Addendum

Above For Official Use Only

Please fill out information in all gray boxes

Title:	**NanTroSEIZE Drilling and Observatory Phase 3: A Window into the Seismogenic Zone**		
Proponent(s):	**Kiyoshi Suyehiro, Harold Tobin, Eiichiro Araki, Susan Bilek, Tadanori Goto, Pierre Henry, Gaku Kimura, Aitaro Kato, Masa Kinoshita, Chris Marone, Greg Moore, J. Casey Moore, Demian Saffer, Arito Sakaguchi, Masanao Shinohara, Ralph Stephen, Akito Tsutsumi, Kohtaro Ujiie, Kelin Wang**		
Keywords: *(5 or less)*	**Seismogenic zone, fault mechanics, borehole observatory, tsunamigenesis**	Area:	**Southwestern Japan margin**

Contact Information:

Contact Person:	**Harold Tobin**		
Department:	**Earth and Environmental Science Department**		
Organization:	**New Mexico Tech**		
Address	**Socorro, NM 87801 USA**		
Tel.:	**505-835-5920**	Fax:	**505-835-6436**
E-mail:	**tobin@nmt.edu**		

Permission to post abstract on iSAS Web site: ☑ Yes ☐ No

Abstract: (*400 words or less)*

The principal goal of NanTroSEIZE is to understand seismogenesis and rupture propagation along subduction plate boundary faults by direct testing of key hypotheses related to the mechanics of subduction megathrusts. **NanTroSEIZE Phase 3 represents the culmination of the Seismogenic Zone Initiative: drilling into, sampling, and monitoring of the subduction zone plate interface at depths of coseismic slip.** This proposal centers on the deepest drilling effort in the NanTroSEIZE project: sampling a single site across the entire plate interface into the top of the subducting Philippine Sea plate. The proposed borehole will penetrate a major splay fault (~4 km bsf) potentially implicated in coseismic slip, as well as the master decollement (~6 km bsf), at a location of shallow large slip during the 1944 Tonankai Mw 8.2 earthquake.

The goal of this proposal is to address two key questions by a combination of logging, coring, down-hole experiments, and long-term monitoring:

(1) What controls the nature of fault slip and its spatial variability (i.e. the updip transition from aseismic to seismogenic slip)?

(2) What processes control temporal changes in slip behavior on a given fault?

Specifically, this proposal is aimed at testing hypotheses explaining controls on unstable slip, and documenting the roles of fault zone state (stress, fluid pressure, fabric) and composition in controlling frictional rheology. Down-hole and monitoring observations, core analyses, and post-cruise laboratory studies will provide direct tests of existing hypothesis for fault zone frictional behavior. One focus of Phase 3 will be on documenting the material properties and ambient conditions at each of the two faults, and comparing results with findings from shallower portions of the plate boundary system sampled during Phases 1 and 2 to rigorously characterize controls on fault slip behavior in an active megathrust system.

Proposed activities include (1) drilling, LWD, and casing of a main hole - with drillstem tests performed at casing set points, (2) creation of a sidetrack coring hole with continuous coring from 4000-6200 mbsf, and (3) well tests in perforated casing and installation of an observatory system for continuous monitoring of pore fluid pressure, temperature, strain, tilt, and seismicity. The borehole observatories, along with surface arrays of measurements, and regional geodetic and seismic monitoring, will provide critical data toward understanding the slip distribution, temporal variability, and controlling mechanisms of seismogenic faulting along the plate boundary system.

603C-Full

Scientific Objectives: (*250 words or less*)

The scientific objectives of NanTroSEIZE Phase 3 drilling are to use *direct observation* to rigorously evaluate the following hypotheses, which are central to understanding earthquake mechanics along subduction megathrusts:

(1) Systematic, progressive material and state changes control the onset of seismogenic behavior on subduction thrusts; (2) Subduction zone megathrusts are weak faults; (3) Within the seismogenic zone, relative plate motion is primarily accommodated by coseismic frictional slip in a concentrated zone; (4) Physical properties, chemistry, and state of the fault zone change systematically with time throughout the earthquake cycle; and (5) The mega-splay (OOST) thrust fault system slips in discrete events which may include tsunamigenic slip during great earthquakes. These hypotheses will be evaluated by detailed characterization – in fault zones and in the surrounding rock volume – of the lithology, structural geology, and physical properties of the rock; the geochemistry of pore fluids; the microbiological activity; the distribution of temperature, stress, and pore fluid pressure in space and time; the seismicity in the near-borehole environment and downdip; the temporal evolution of the strain field; and the evolution of physical properties in the volume around the borehole.

Please describe below any non-standard measurements technology needed to achieve the proposed scientific objectives.

Essentially all technologies to be used are non-standard. These will include, but are not limited to:
Riser-based drilling, LWD suite, DVTP-P, active hydrofracturing tests (wireline packer test), VSP.
A borehole observatory with multi-level packers and perforated intervals, Geodetic (strain/tilt), seismic and hydrologic (P,T) sensors and other instruments will be installed for a long-term borehole observatory.

Proposed Sites:

Site Name	Position	Water Depth (m)	Penetration (m)			Brief Site-specific Objectives
			Sed	Bsm	Total	
NT3-01A	33°17.6'N, 136°38.6'E	1950	6000	200	6200	Study the progressive change in the fault properties by intersecting the splay fault at ~4.5km and the seismogenic fault at 5.8 to 6km depth
NT3-02A	33°12.9'N, 136°27.4'E	2100	6000	200	6200	Alternate site for NT3-01A

iSAS/IODP Site Summary Forms:
Form 1 - General Site Information

Please fill out information in all gray boxes
Revised 7 March 2002

603C-Full

New ✓ **Revised**

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 3: A Window into the Seismogenic Zone
Date Form Submitted:	Apr. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Sample and instrument decollement, mega-splay, and wall rock of lower prism to address fault rheology, slip history, and temporal change objectives. Priority:1
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT3-01A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 17.6 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 38.6 E	Distance to Land:	45 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary: X	Alt:	Water Depth:	1,950 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	5800 - 6000	200
	What is the total sed. thickness? >5,500 m	
	Total Penetration: 6,200 m	

General Lithologies: Slope basin clastic sediments, accreted and deformed trench turbidites, hemipelagic and pelagic mudstones, pillow basalt.

Coring Plan: *(Specify or Circle)*

Continuous coring may be replaced with LWD logging in intervals

1-2-3-APC ☑ HPC* XCB ☑ MDCB* PCS ☑ RCB Re-entry HRGB ☐ ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools		Special Tools				LWD	
Neutron-Porosity	☑	Borehole Televiewer	☐	Formation Fluid Sampling	☑	Density-Neutron	☑
Litho-Density	☑	Nuclear Magnetic Resonance	☑	Borehole Temperature & Pressure	☑	Resistivity-Gamma Ray	☑
Gamma Ray	☑	Geochemical	☐	Borehole Seismic	☑	Acoustic	☑
Resistivity	☑	Side-Wall Core Sampling	☐				
Acoustic	☑						
Formation Image	☑			Others ( )		Others (FMI)	☑

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 150-170 degC

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from 1500 m to 3600 m, 5 m intervals

from 4300 m to 6200 m, 5 m intervals

Basic Sampling Intervals: 5m

Estimated days: Drilling/Coring: ??? | Logging: ?? | Total On-Site: ???

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Long-term observatory installation and data telemetry/recording

Hazards/ Weather:

Please check following List of Potential Hazards

						What is your Weather window? (Preferable period with the reasons)
Shallow Gas	☐	Complicated Seabed Condition	☐	Hydrothermal Activity	☐	May – August optimal (typhoon risk in late August to September)
Hydrocarbon	☐	Soft Seabed	☐	Landslide and Turbidity Current	☐	
Shallow Water Flow	☐	Currents	☑	Methane Hydrate	☑	
Abnormal Pressure	☐	Fractured Zone	☐	Diapir and Mud Volcano	☐	
Man-made Objects	☑	Fault	☑	High Temperature	☐	
H_2S	☐	High Dip Angle	☐	Ice Conditions	☐	
CO_2	☐					

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☑ *Revised* ☐

Proposal #:	Site #: NT3-01A	Date Form Submitted: Apr. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-L (Feb. 2003) Crossing Lines(s): JAMSTEC Line-9 (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-5 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and PODM migration velocity from MCS lines. OBS wide-angle data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003, also IFREE lines from 1998 - 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-term monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity		YES	Obana et al., in press
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ✓ *Revised* ☐

Proposal #:	Site #: NT3-01A	Date Form Submitted: Apr. 1, 2003
Water Depth (m): 1950	Sed. Penetration (m): 6000	Basement Penetration (m): 200

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ✓
Are high temperatures expected at this site? Yes ✓ No
Are there any other special requirements for logging at this site? Yes ☐ No ✓
If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic	Yes, dipole sonic, LWD sonic for physical properties	
FMS	Preferably FMI & RAB. Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV	Perhaps?	
Resistivity-Laterolog	LWD resistivity	
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	RAB, VSP Hydrofracturing, Packer injection test Geodetic/Seismic and multi-level packer borehole observatory	1

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:
borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

iSAS/IODP Site Summary Forms:

Form 4 – Pollution & Safety Hazard Summary

Please fill out information in all gray boxes

New ✓ *Revised* ☐

Proposal #:	Site #: NT3-01A	Date Form Submitted: Apr. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 6200 m or 200 m into basement.
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct BSR drilling in eastern Nankai in 2004. This data will be used for our program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	Except for normal gas hydrate occurrence, none.
6	What "special" precautions will be taken during drilling?	Fault zones are likely unstable and overpressured, prone to collapse, possible pressure kicks.
7	What abandonment procedures do you plan to follow:	Unknown at this time for riser operations
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current, shallow overpressure (but latter is probably not major

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

Proposal #:	Site #: NT3-01A	Date Form Submitted: Apr. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
200 1000 4500 6000	Unconformity Unconformity Fault fault	Holocene to Miocene	1.6-2.5km/s	Slope sediments to old accretionary rocks	Accretionary prism		

iSAS/IODP Site Summary Forms:
Form 1 - General Site Information

Please fill out information in all gray boxes
Revised 7 March 2002

603C-Full

New ✓ **Revised**

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 3: A Window into the Seismogenic Zone
Date Form Submitted:	Apr. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Sample and instrument decollement, mega-splay, and wall rock of lower prism to address fault rheology, slip history, and temporal change objectives. Priority:2
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT3-02A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 12.9 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 27.4 E	Distance to Land:	45 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary: X	Alt: X	Water Depth:	1,950 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	5800 - 6000	200
	What is the total sed. thickness? >5,500 m	
	Total Penetration: 6,200 m	

General Lithologies: Slope basin clastic sediments, accreted and deformed trench turbidites, hemipelagic and pelagic mudstones, pillow basalt.

Coring Plan: *(Specify or Circle)*

Continuous coring may be replaced with LWD logging in intervals

1-2-3-APC ☑ HPC* XCB ☑ MDCB* PCS ☑ RCB Re-entry HRGB ☐ ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools		Special Tools				LWD	
Neutron-Porosity	☑	Borehole Televiewer	☐	Formation Fluid Sampling	☑	Density-Neutron	☑
Litho-Density	☑	Nuclear Magnetic Resonance	☑	Borehole Temperature & Pressure	☑	Resistivity-Gamma Ray	☑
Gamma Ray	☑	Geochemical	☐	Borehole Seismic	☑	Acoustic	☑
Resistivity	☑	Side-Wall Core Sampling	☐				
Acoustic	☑						
Formation Image	☑			Others ( )		Others (FMI)	☑

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 150-170 degC

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from 1500 m to 3600 m, 5 m intervals

from 4300 m to 6200 m, 5 m intervals

Basic Sampling Intervals: 5m

Estimated days: Drilling/Coring: ??? | Logging: ?? | Total On-Site: ???

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Long-term observatory installation and data telemetry/recording

Hazards/ Weather:

Please check following List of Potential Hazards

						What is your Weather window? (Preferable period with the reasons)
Shallow Gas	☐	Complicated Seabed Condition	☐	Hydrothermal Activity	☐	May – August optimal (typhoon risk in late August to September)
Hydrocarbon	☐	Soft Seabed	☐	Landslide and Turbidity Current	☐	
Shallow Water Flow	☐	Currents	☑	Methane Hydrate	☑	
Abnormal Pressure	☐	Fractured Zone	☐	Diapir and Mud Volcano	☐	
Man-made Objects	☑	Fault	☑	High Temperature	☐	
H_2S	☐	High Dip Angle	☐	Ice Conditions	☐	
CO_2	☐					

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☑ *Revised* ☐

Proposal #:	Site #: NT3-02A	Date Form Submitted: Apr. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-B (Feb. 2003) Crossing Lines(s): JAMSTEC Line-9 (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-5, 3 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and PODM migration velocity from MCS lines. OBS wide-angle data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003, also IFREE lines from 1998 - 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-term monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity		YES	Obana et al., in press
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ✓ *Revised* ☐

Proposal #:	Site #: NT3-01A	Date Form Submitted: Apr. 1, 2003
Water Depth (m): 1950	Sed. Penetration (m): 6000	Basement Penetration (m): 200

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ✓
Are high temperatures expected at this site? Yes ✓ No
Are there any other special requirements for logging at this site? Yes ☐ No ✓
If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic	Yes, dipole sonic, LWD sonic for physical properties	
FMS	Preferably FMI & RAB. Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV	Perhaps?	
Resistivity-Laterolog	LWD resistivity	
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	RAB, VSP Hydrofracturing, Packer injection test Geodetic/Seismic and multi-level packer borehole observatory	1

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:
borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

iSAS/IODP Site Summary Forms:

Form 4 – Pollution & Safety Hazard Summary

Please fill out information in all gray boxes

New ✓ *Revised* ☐

Proposal #:	Site #: NT3-01A	Date Form Submitted: Apr. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 6200 m or 200 m into basement.
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct BSR drilling in eastern Nankai in 2004. This data will be used for our program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	Except for normal gas hydrate occurrence, none.
6	What "special" precautions will be taken during drilling?	Fault zones are likely unstable and overpressured, prone to collapse, possible pressure kicks.
7	What abandonment procedures do you plan to follow:	Unknown at this time for riser operations
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current, shallow overpressure (but latter is probably not major

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

Proposal #:	Site #: NT3-01A	Date Form Submitted: Apr. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
200 1000 4500 6000	Unconformity Unconformity Fault fault	Holocene to Miocene	1.6-2.5km/s	Slope sediments to old accretionary rocks	Accretionary prism		

Received 1 April 2004

IODP Proposal Cover Sheet

603C-Full

☑ New ☐ Revised ☐ Addendum

Above For Official Use Only

Please fill out information in all gray boxes

Title:	**NanTroSEIZE Drilling and Observatory Phase 3: A Window into the Seismogenic Zone**		
Proponent(s):	**Kiyoshi Suyehiro, Harold Tobin, Eiichiro Araki, Susan Bilek, Tadanori Goto, Pierre Henry, Gaku Kimura, Aitaro Kato, Masa Kinoshita, Chris Marone, Greg Moore, J. Casey Moore, Demian Saffer, Arito Sakaguchi, Masanao Shinohara, Ralph Stephen, Akito Tsutsumi, Kohtaro Ujiie, Kelin Wang**		
Keywords: *(5 or less)*	**Seismogenic zone, fault mechanics, borehole observatory, tsunamigenesis**	Area:	**Southwestern Japan margin**

Contact Information:

Contact Person:	**Harold Tobin**		
Department:	**Earth and Environmental Science Department**		
Organization:	**New Mexico Tech**		
Address	**Socorro, NM 87801 USA**		
Tel.:	**505-835-5920**	Fax:	**505-835-6436**
E-mail:	**tobin@nmt.edu**		

Permission to post abstract on iSAS Web site: ☑ Yes ☐ No

Abstract: (*400 words or less)*

The principal goal of NanTroSEIZE is to understand seismogenesis and rupture propagation along subduction plate boundary faults by direct testing of key hypotheses related to the mechanics of subduction megathrusts. **NanTroSEIZE Phase 3 represents the culmination of the Seismogenic Zone Initiative: drilling into, sampling, and monitoring of the subduction zone plate interface at depths of coseismic slip.** This proposal centers on the deepest drilling effort in the NanTroSEIZE project: sampling a single site across the entire plate interface into the top of the subducting Philippine Sea plate. The proposed borehole will penetrate a major splay fault (~4 km bsf) potentially implicated in coseismic slip, as well as the master decollement (~6 km bsf), at a location of shallow large slip during the 1944 Tonankai Mw 8.2 earthquake.

The goal of this proposal is to address two key questions by a combination of logging, coring, down-hole experiments, and long-term monitoring:

(1) What controls the nature of fault slip and its spatial variability (i.e. the updip transition from aseismic to seismogenic slip)?

(2) What processes control temporal changes in slip behavior on a given fault?

Specifically, this proposal is aimed at testing hypotheses explaining controls on unstable slip, and documenting the roles of fault zone state (stress, fluid pressure, fabric) and composition in controlling frictional rheology. Down-hole and monitoring observations, core analyses, and post-cruise laboratory studies will provide direct tests of existing hypothesis for fault zone frictional behavior. One focus of Phase 3 will be on documenting the material properties and ambient conditions at each of the two faults, and comparing results with findings from shallower portions of the plate boundary system sampled during Phases 1 and 2 to rigorously characterize controls on fault slip behavior in an active megathrust system.

Proposed activities include (1) drilling, LWD, and casing of a main hole - with drillstem tests performed at casing set points, (2) creation of a sidetrack coring hole with continuous coring from 4000-6200 mbsf, and (3) well tests in perforated casing and installation of an observatory system for continuous monitoring of pore fluid pressure, temperature, strain, tilt, and seismicity. The borehole observatories, along with surface arrays of measurements, and regional geodetic and seismic monitoring, will provide critical data toward understanding the slip distribution, temporal variability, and controlling mechanisms of seismogenic faulting along the plate boundary system.

603C-Full

Scientific Objectives: (*250 words or less*)

The scientific objectives of NanTroSEIZE Phase 3 drilling are to use *direct observation* to rigorously evaluate the following hypotheses, which are central to understanding earthquake mechanics along subduction megathrusts:

(1) Systematic, progressive material and state changes control the onset of seismogenic behavior on subduction thrusts; (2) Subduction zone megathrusts are weak faults; (3) Within the seismogenic zone, relative plate motion is primarily accommodated by coseismic frictional slip in a concentrated zone; (4) Physical properties, chemistry, and state of the fault zone change systematically with time throughout the earthquake cycle; and (5) The mega-splay (OOST) thrust fault system slips in discrete events which may include tsunamigenic slip during great earthquakes. These hypotheses will be evaluated by detailed characterization – in fault zones and in the surrounding rock volume – of the lithology, structural geology, and physical properties of the rock; the geochemistry of pore fluids; the microbiological activity; the distribution of temperature, stress, and pore fluid pressure in space and time; the seismicity in the near-borehole environment and downdip; the temporal evolution of the strain field; and the evolution of physical properties in the volume around the borehole.

Please describe below any non-standard measurements technology needed to achieve the proposed scientific objectives.

Essentially all technologies to be used are non-standard. These will include, but are not limited to:
Riser-based drilling, LWD suite, DVTP-P, active hydrofracturing tests (wireline packer test), VSP.
A borehole observatory with multi-level packers and perforated intervals, Geodetic (strain/tilt), seismic and hydrologic (P,T) sensors and other instruments will be installed for a long-term borehole observatory.

Proposed Sites:

Site Name	Position	Water Depth (m)	Penetration (m)			Brief Site-specific Objectives
			Sed	Bsm	Total	
NT3-01A	33°17.6'N, 136°38.6'E	1950	6000	200	6200	Study the progressive change in the fault properties by intersecting the splay fault at ~4.5km and the seismogenic fault at 5.8 to 6km depth
NT3-02A	33°12.9'N, 136°27.4'E	2100	6000	200	6200	Alternate site for NT3-01A

Received 1 April 2005

IODP Proposal Cover Sheet

603D-Full2

☐ **New** ☒ **Revised** ☐ **Addendum**

Please fill out information in all gray boxes

Above For Official Use Only

Title:	The Nankai Trough Seismogenic Zone Experiment: Observatory Science at the Reference Sites		
Proponent(s):	Elizabeth Screaton, Michael Underwood, Demian Saffer, Kelin Wang, Geoff Wheat, Koichiro Obana, Greg Moore, Kevin Brown, Juichiro Ashi		
Keywords: *(5 or less)*	Subduction inputs; hydrogeology; long-term observatories	Area:	Nankai Trough Shikoku Basin

Contact Information:

Contact Person:	Elizabeth Screaton		
Department:	Department of Geology		
Organization:	University of Florida		
Address	PO Box 112120, 241 Williamson, Gainesville FL 32611 USA		
Tel.:	(352) 392-4612	Fax:	(352) 392-9294
E-mail:	screaton@ ufl.edu		

Permission to post abstract on IODP-MI Sapporo Web site: ☒ Yes ☐ No

Abstract: (*400 words or less)*

The NanTroSEIZE Complex Drilling Plan describes a multi-phase strategy to get at the root cause of the transition from stable sliding to stick-slip fault behavior -- by intersecting the "seismogenic conveyor belt" of Nankai Trough on either side of its up-dip limit of seismicity. With a campaign of coring, logging, downhole measurements, and long-term observatory science, NanTroSEIZE will test hypotheses concerning the onset of seismogenic behavior and locking of subduction thrusts. Characterizing the inputs to the seismogenic zone through examination of reference sites is a vital component of NanTroSEIZE. This revised full proposal outlines scientific rationale and plans for installation of long-term borehole observatories at NantroSEIZE reference sites. Monitoring at these observatories serves two distinct purposes. First, the observatories will provide information on material properties and background geophysical and geochemical conditions. The state of stress and strength of coupling on the plate-boundary fault are acutely sensitive to 3-D variations in pore pressure, and these pore pressures will be greatly affected by the distribution and permeability of turbidites and the permeability of the ocean crust. Second, observatories allow us to detect temporal changes in the geophysical or geochemical conditions and even the material properties. Temporal changes include the gradual stress build-up during the interseismic period. Associated variations in the thermal and hydrological regimes, and episodic seismic and aseismic strain events, could show how the seismogenic zone adjusts to new conditions caused by the stress build-up, which elevates predictive understanding of the seismogenic zone. Two reference sites in Shikoku Basin, on a basement high and basement plain, will show how stratigraphy, basement topography, and thermal structure affect the physical and hydrologic properties of subduction inputs. Each will require a pair of screened intervals: one targeting open basement and one targeting the overlying sediment. A site located 7 km seaward of the deformation front will indicate how far pressure and chemistry anomalies are transmitted seaward of the deformation front. CORK monitoring at the toe of the accretionary prism will isolate temperature and pressure signals in the frontal décollement from signals in the subducting turbidites. A second shallow observatory at the prism toe will monitor micro-seismicity and strain. An observatory in Kumano Basin provides an important complement to background and transient data obtained within and seaward of the mega-splay system. This monitoring network will provide a vital context for observations within the plate boundary fault system.

603D-Full2

Scientific Objectives: (*250 words or less*)

Coring, logging, and conventional downhole measurements will commence at four reference sites during Phase I and II of the Nankai Trough Seismogenic Zone Experiment. This proposal describes scientific objectives for long-term borehole observatories to be installed at four of these sites and one additional site. The fundamental objectives of the proposed observatory science are to map background properties of the incoming sediment and crust and to monitor temporal changes associated with the seismic cycle. Specific objectives include:
(1) Monitor the differences in hydrologic properties and fluid-flow signals where basement highs are subducting versus where basement plains are subducting.
(2) Determine if, where, and why compartments of excess pore pressure develop seaward of the deformation front; if present, determine their effect on early-subduction fault dynamics.
(3) Compare hydrologic properties and fluid-flow signals in turbidite sand bodies before and after they have passed beneath the toe of the accretionary prism Assess the role of these turbidite sand bodies in drainage of deeper sediments, and impacts of drainage on plate boundary strength.
(4) Monitor hydrologic properties and fluid-flow signals within the frontal décollement zone for rigorous comparison against properties and flow in subducted sand lenses beneath the décollement.
(5) Determine how basement fluid flow influences margin-scale patterns of heat flow and fluid flow.
(6) Monitor micro-seismicity, strain, and fluid flow response to tectonic events.

Please describe below any non-standard measurements technology needed to achieve the proposed scientific objectives.

Proposed Sites:

Site Name	Position	Water Depth (m)	Penetration (m)			Brief Site-specific Objectives
			Sed	Bsm	Total	
NT1-01A	Lat: 32° 44.8878'N Long: 136° 55.0236'E	3540	460m	40m	500m	One CORK hole with screened interval in position equivalent to turbidites and sealed basement. Companion CORK hole with fully cased sediment & open basement.
NT1-02A	Lat: 32° 47.4996'N Long: 137° 09.2784' E	4210	730m	40m	770m	One CORK hole with screened interval in turbidites and sealed basement. Companion CORK hole with fully cased sediment and open basement.
NT1-03A	Lat: 33° 01.23258'N Long: 136° 47.9485'E	4125	1200m	0m	1200m	CORK monitoring of décollement and turbidites; will not extend to basement. Monitor micro-seismicity and strain.
NT1-05A	Lat: 33° 01.3482'N Long: 137° 3.3432'E	4310	1528m	40m	1568m	One CORK hole with screened intervals in turbidites and sealed basement. Companion CORK hole with fully cased sediment and open basement.
NT1-06A	Lat: 32° 51.35'N Long: 137° 17.58'E	4200	990m	40m	1030m	Alternate to NT1-02A. One CORK hole with screened interval in turbidites and sealed basement. Companion CORK hole with fully cased sediment and open basement.
NT2-04A	Lat: 33° 23.4'N, Long: 136° 34.6'E	1990	1400m forearc basin	40m acoustic basement	1440m	One CORK hole with screened intervals in sediments. Monitor micro-seismicity and strain.

Received 1 April 2005

IODP Proposal Cover Sheet

603D-Full2

☐ **New** ☒ **Revised** ☐ **Addendum**

Please fill out information in all gray boxes

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Proponent(s):	Elizabeth Screaton, Michael Underwood, Demian Saffer, Kelin Wang, Geoff Wheat, Koichiro Obana, Greg Moore, Kevin Brown, Juichiro Ashi		
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603D-Full2

Scientific Objectives: (*250 words or less*)

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NT2-04A	Lat: 33° 23.4'N, Long: 136° 34.6'E	1990	1400m forearc basin	40m acoustic basement	1440m	One CORK hole with screened intervals in sediments. Monitor micro-seismicity and strain.

IODP Site Summary Forms:

Form 1 - General Site Information

603D-Full2

Please fill out information in all gray boxes
Revised 7 March 2002

New ■ **Revised** □

Section A: Proposal Information

Title of Proposal:	The Nankai Trough Seismogenic Zone Experiment: Observatory Science at the Reference Sites
Date Form Submitted:	Sept. 30, 2004
Site Specific Objectives with Priority (Must include general objectives in proposal)	One CORK hole with screened interval in turbidites and sealed basement. Companion CORK hole with fully cased sediment and open basement. Reference site to characterize hydrology of Shikoku Basin strata and upper igneous crust where a bathymetric mound is underlain by a basement high. Objectives are to show how stratigraphy, basement topography, and thermal structure affect the physical and hydrologic properties of subduction inputs.
List Previous Drilling in Area:	This site would be a return to NT1-01A, which is proposed to be drilled in 603A-Full2 (NantroSEIZE Reference Sites).

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT1-01A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Nankai Trough off Kii
Latitude:	Deg: 32 N	Min: :44.8878	Jurisdiction:	Japan
Longitude:	Deg: 136 E	Min: 55.0236	Distance to Land:	130 km to Cape Shiono-Misaki
Coordinates System:	WGS 84, Other ( )			
Priority of Site:	Primary:x	Alt:	Water Depth:	3540 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	460 What is the total sed. thickness? 460 m	40
	Total Penetration: 500 m	
General Lithologies:	Possible silt/mud turbidites and ash layers Hemipelagic mud and mudstone	Basalt
Coring Plan: *(Specify or check)*	Limited coring as necessary to confirm screen locations for CORKs	
	1-2-3-APC ☐ VPC* ☐ CB ☐ DCB* ☐ CS ☐ RCB ☐ Re-entry ☐ HLAPC ☐	
	** Systems Currently Under Development*	

Wireline Logging Plan:

Standard Tools	Special Tools		LWD
Neutron-Porosity ☐	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ☐
Litho-Density ☐	Nuclear Magnetic Resonance ☐	Borehole Temperature & Pressure ☐	Resistivity-Gamma Ray ☐
Gamma Ray ☐	Geochemical ☐	Borehole Seismic ☐	Acoustic ☐
Resistivity ☐ ☐	Side-Wall Core Sampling ☐	Limited measurements if needed to fill gaps from previous (Phase I) drilling.	
Acoustic ☐			
Formation Image		Others ( )	Others ( )

Max.Borehole Temp. :
Expected value (For Riser Drilling)
_____°C

Mud Logging: *(Riser Holes Only)*
Cuttings Sampling Intervals
from _____ m to _____ m, _____ m intervals
from _____ m to _____ m, _____ m intervals
Basic Sampling Intervals: 5m

Estimated days:

Drilling/Coring: 5	Logging: 12 (install casing/CORKs)	Total On-Site: 17

Future Plan:
Longterm Borehole Observation Plan/Re-entry Plan
Long term monitoring (CORKs) of basement and overlying sediments.

Hazards/ Weather:
Please check following List of Potential Hazards

Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐
Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐
Shallow Water Flow ☐	Currents ■	Methane Hydrate ☐
Abnormal Pressure ☐	Fractured Zone ☐	Diapir and Mud Volcano ☐
Man-made Objects ☐	Fault ☐	High Temperature ☐
H_2S ☐	High Dip Angle ☐	Ice Conditions ☐
CO_2 ☐		

What is your Weather window? (Preferable period with the reasons)
April-July: Avoid typhoon season

Form 2 - Site Survey Detail

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☐

'roposal #: 603D-Full	Site #: NT1-01A	Date Form Submitted: Sept. 30, 2004

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		No	Primary Line(s) :Location of Site on line (SP or Time only) Crossing Lines(s):
2	Deep Penetration seismic reflection		Yes	Primary Line(s): KR9806-2 SP2710 Location of Site on line (SP or Time only) Crossing Lines(s): KR0211-S0
3	Seismic Velocity†		Yes	Stacking velocity and migration velocity from MCS lines. OBS data.
4	Seismic Grid		Yes	
5a	Refraction (surface)		Yes	Two ship COP (maximum offset 20 km) obtained by JAMSTEC.
5b	Refraction (near bottom)		Yes	OBS data by Nakanishi et al. (1997)
6	3.5 kHz			Location of Site on line (Time)
7	Swath bathymetry		Yes	Multi-narrow-beam data by JAMSTEC R/V Yokusuka.
8a	Side-looking sonar (surface)		No	
8b	Side-looking sonar (bottom)		No	
9	Photography or Video		No	
10	Heat Flow		Yes.	
11a	Magnetics		Yes	Compiled map published from AIST, Japan.
11b	Gravity		Yes	Compiled map published from AIST, Japan.
12	Sediment cores		No	
13	Rock sampling		No	
14a	Water current data			Available on JODC web page (http://www.jodc.go.jp)
14b	Ice Conditions			
15	OBS microseismicity		Yes	
16	Navigation		Yes	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

IODP Site Summary Forms:

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT1-01A	Date Form Submitted: Sept. 30, 2004
Water Depth (m): 3540	Sed. Penetration (m): 460	Basement Penetration (m): 40

Do you need to use the conical side-entry sub (CSES) at this site? Yes □ No ■

Are high temperatures expected at this site? Yes □ No ■

Are there any other special requirements for logging at this site? Yes □ No ■

If "Yes" Please describe requirements: No logging planned. Site will have been logged in previous phase. CORK installation only

What do you estimate the total logging time for this site to be: 12 days install casing/CORKS

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity		
Litho-Density		
Natural Gamma Ray		
Resistivity-Induction		
Acoustic		
FMS		
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)		
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	CORK	

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT1-01A	Date Form Submitted: Sept. 30, 2004

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	RCB with limited coring to confirm monitoring intervals for CORK. CORK installation
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	None
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	No
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	No
6	What "special" precautions will be taken during drilling?	None
7	What abandonment procedures do you plan to follow:	None. Holes will be CORKed.
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current. Typhoon season (June to Oct)
9	Summary: What do you consider the major risks in drilling at this site?	Current

IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ■ *Revised* □

New

Proposal #: 603D-Full	Site #: NT1-01A	Date Form Submitted: Sept. 30, 2004

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
seafloor			1.6-1.9	Hemipelagite	Backarc basin Floor	23 m/my	
460	Unconformity	20 Ma	2.0	Volcanic sediment and basement basalt	Backarc basin spreading ridge		
560	Total depth						

603D-Full2

IODP Site Summary Forms:

Form 1 - General Site Information

Please fill out information in all gray boxes
Revised 7 March 2002

New ■ **Revised** □

Section A: Proposal Information

Title of Proposal:	The Nankai Trough Seismogenic Zone Experiment: Observatory Science at the Reference Sites
Date Form Submitted:	Sept. 30, 2004
Site Specific Objectives with Priority (Must include general objectives in proposal)	One CORK hole with screened interval in turbidites and sealed basement. Companion CORK hole with fully cased sediment and open basement. Reference site to characterize hydrology of Shikoku Basin strata and upper igneous crust where basement topography is relatively flat. Objectives are to document how stratigraphy, basement topography, and thermal structure affect the physical and hydrologic properties of subduction inputs.
List Previous Drilling in Area:	This site would be a return to NT1-02A, which is proposed to be drilled in 603A-Full2 (NantroSEIZE Reference Sites).

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT1-02A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Nankai Trough off Kii
Latitude:	Deg: 32 N	Min: :47.4996	Jurisdiction:	Japan
Longitude:	Deg: 137 E	Min: 9.2784	Distance to Land:	145 km to Cape Shiono-Misaki
Coordinates System:	WGS 84,	Other ( )		
Priority of Site:	Primary:x	Alt:	Water Depth:	4210 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	730 What is the total sed. thickness? 730 m	40
	Total Penetration: 770 m	
General Lithologies:	Possible silt/mud turbidites and ash layers Hemipelagic mud and mudstone	Basalt
Coring Plan: *(Specify or check)*	Limited coring as necessary to confirm screen locations for CORKs	
	1-2-3-APC ☐ VPC* ☐ CB ☐ DCB* ☐ CS ☐ RCB ☐ Re-entry ☐ HLAPC ☐ ** Systems Currently Under Development*	

Wireline Logging Plan:

Standard Tools	Special Tools		LWD
Neutron-Porosity ☐	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ☐
Litho-Density ☐	Nuclear Magnetic Resonance ☐	Borehole Temperature & Pressure ■	Resistivity-Gamma Ray ☐
Gamma Ray ☐	Geochemical ☐	Borehole Seismic ☐	Acoustic ☐
Resistivity ☐ ☐	Side-Wall Core Sampling ☐	Limited measurements if needed to fill gaps from previous (Phase I) drilling.	
Acoustic ☐			
Formation Image		Others ( )	Others ( )

Max.Borehole Temp. :	*Expected value (For Riser Drilling)* _____°C
Mud Logging: *(Riser Holes Only)*	Cuttings Sampling Intervals from _____ m to _____ m, _____ m intervals from _____ m to _____ m, _____ m intervals *Basic Sampling Intervals: 5m*
Estimated days:	Drilling/Coring: 6 days; Logging: 12 (install casing/CORKs); Total On-Site: 18 days
Future Plan:	*Longterm Borehole Observation Plan/Re-entry Plan* Long term monitoring (CORKs) of basement and overlying sediments.

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐
Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐
Shallow Water Flow ☐	Currents ■	Methane Hydrate ☐
Abnormal Pressure ☐	Fractured Zone ☐	Diapir and Mud Volcano ☐
Man-made Objects ☐	Fault ☐	High Temperature ☐
H_2S ☐	High Dip Angle ☐	Ice Conditions ☐
CO_2 ☐		

What is your Weather window? (Preferable period with the reasons)

April-July: Avoid typhoon season

Form 2 - Site Survey Detail

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* □

'roposal #: 603D-Full	Site #: NT1-02A	Date Form Submitted: Sept. 30, 2004

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		No	Primary Line(s) :Location of Site on line (SP or Time only) Crossing Lines(s):
2	Deep Penetration seismic reflection		Yes	Primary Line(s): KR9806-1 SP1740 Location of Site on line (SP or Time only) Crossing Lines(s): KR0211-S0 nearby
3	Seismic Velocity†		Yes	Stacking velocity and migration velocity from MCS lines. OBS data.
4	Seismic Grid		Yes	
5a	Refraction (surface)		Yes	Two ship COP (maximum offset 20 km) obtained by JAMSTEC.
5b	Refraction (near bottom)		Yes	OBS data by Nakanishi et al. (1997)
6	3.5 kHz			Location of Site on line (Time)
7	Swath bathymetry		Yes	Multi-narrow-beam data by JAMSTEC R/V Yokusuka.
8a	Side-looking sonar (surface)		No	
8b	Side-looking sonar (bottom)		No	
9	Photography or Video		No	
10	Heat Flow		Yes.	
11a	Magnetics		Yes	Compiled map published from AIST, Japan.
11b	Gravity		Yes	Compiled map published from AIST, Japan.
12	Sediment cores		No	
13	Rock sampling		No	
14a	Water current data			Available on JODC web page (http://www.jodc.go.jp)
14b	Ice Conditions			
15	OBS microseismicity		Yes	
16	Navigation		Yes	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

IODP Site Summary Forms:

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT1-02A	Date Form Submitted: Sept. 30, 2004
Water Depth (m): 4210	Sed. Penetration (m): 730	Basement Penetration (m): 40

Do you need to use the conical side-entry sub (CSES) at this site? Yes □ No ■

Are high temperatures expected at this site? Yes □ No ■

Are there any other special requirements for logging at this site? Yes □ No ■

If "Yes" Please describe requirements: No logging planned. Site will have been logged in previous phase. CORK installation only

What do you estimate the total logging time for this site to be: 12 days (CORK/casing install)

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity		
Litho-Density		
Natural Gamma Ray		
Resistivity-Induction		
Acoustic		
FMS		
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)		
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	CORK	

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT1-02A	Date Form Submitted: Sept. 30, 2004

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	RCB with limited coring to confirm monitoring intervals for CORK. CORK installation
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	None
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	No
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	No
6	What "special" precautions will be taken during drilling?	May need casing of sandy turbidites prior to basement drilling/basement CORK installation.
7	What abandonment procedures do you plan to follow:	None. Holes will be CORKed.
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current. Typhoon season (June to Oct)
9	Summary: What do you consider the major risks in drilling at this site?	Current

IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ■ *Revised* □

New

Proposal #: 603D-Full	Site #: NT1-02A	Date Form Submitted: Sept. 30, 2004

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
seafloor 730 830	 Unconformity Total depth	 20 Ma	1.6-1.9 2.0	Hemipelagite and turbidites Volcanic sediment and basement basalt	Backarc basin Floor Backarc basin spreading ridge	36 m/my	Heterogeneous stratigraphy with irregular packets of turbidite sand.

603D-Full2

IODP Site Summary Forms:

Form 1 - General Site Information

Please fill out information in all gray boxes
Revised 7 March 2002

New ■ **Revised** □

Section A: Proposal Information

Title of Proposal:	The Nankai Trough Seismogenic Zone Experiment: Observatory Science at the Reference Sites
Date Form Submitted:	Sept. 30, 2004
Site Specific Objectives with Priority (Must include general objectives in proposal)	Reference site to characterize hydrology of decollement and underlying turbidites at the toe of the accretionary prism and to monitor micro-seismicity and strain. Objectives are to install CORK to monitor hydrologic properties and fluid-flow signals within and below the frontal décollement zone.
List Previous Drilling in Area:	This site would be a return to NT1-03A, which is proposed to be drilled in 603A-Full2 (NantroSEIZE Reference Sites).

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT1-03A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Nankai Trough off Kii
Latitude:	Deg: 33 N	Min: 1.23258	Jurisdiction:	Japan
Longitude:	Deg: 136 E	Min: 47.94852	Distance to Land:	100 km to Cape Shiono-Misaki
Coordinates System:	WGS 84, Other ( )			
Priority of Site:	Primary:x	Alt:	Water Depth:	4125 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	1200 What is the total sed. thickness? 1740 m	
	Total Penetration: 1200 m	
General Lithologies:	Silt and sand turbidites, ash layers, hemipelagic mud and mudstone	
Coring Plan: *(Specify or check)*	Limited coring as necessary to confirm screen locations for CORKs	
	1-2-3-APC ☐ VPC* ☐ CB ☐ DCB* ☐ CS ■ Re-entry HLAPC ☐	
	** Systems Currently Under Development*	

Wireline Logging Plan:

Standard Tools	Special Tools		LWD
Neutron-Porosity ☐	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ☐
Litho-Density ☐	Nuclear Magnetic Resonance ☐	Borehole Temperature & Pressure ■	Resistivity-Gamma Ray ☐
Gamma Ray ☐	Geochemical ☐	Borehole Seismic ☐	Acoustic ☐
Resistivity ☐ ☐	Side-Wall Core Sampling ☐	Limited measurements if needed to fill gaps from previous (Phase I) drilling.	
Acoustic ☐			
Formation Image		Others ( )	Others ( )

Max.Borehole Temp. :	*Expected value (For Riser Drilling)* _____°C
Mud Logging: *(Riser Holes Only)*	Cuttings Sampling Intervals from _____ m to _____ m, _____ m intervals from _____ m to _____ m, _____ m intervals *Basic Sampling Intervals: 5m*
Estimated days:	Drilling/Coring: 6 days; Logging:12 (install casing/CORKs); Total On-Site: 18 days
Future Plan:	*Longterm Borehole Observation Plan/Re-entry Plan* Long term monitoring (CORKs) of turbidites and decollement.

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐
Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐
Shallow Water Flow ☐	Currents ■	Methane Hydrate ☐
Abnormal Pressure ☐	Fractured Zone ■	Diapir and Mud Volcano ☐
Man-made Objects ☐	Fault ■	High Temperature ☐
H_2S ☐	High Dip Angle ☐	Ice Conditions ☐
CO_2 ☐		

What is your Weather window? (Preferable period with the reasons)

April-July: Avoid typhoon season

Form 2 - Site Survey Detail

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* □

'roposal #: 603D-Full	Site #: NT1-03A	Date Form Submitted: Sept. 30, 2004

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		No	Primary Line(s) :Location of Site on line (SP or Time only) Crossing Lines(s):
2	Deep Penetration seismic reflection		Yes	Primary Line(s): KR0108-4 SP16550 Location of Site on line (SP or Time only) Crossing Lines(s):
3	Seismic Velocity†		Yes	Stacking velocity and migration velocity from MCS lines. OBS data.
4	Seismic Grid		Yes	
5a	Refraction (surface)		Yes	Two ship COP (maximum offset 20 km) obtained by JAMSTEC.
5b	Refraction (near bottom)		Yes	OBS data by Nakanishi et al. (1997)
6	3.5 kHz			Location of Site on line (Time)
7	Swath bathymetry		Yes	Multi-narrow-beam data by JAMSTEC R/V Yokusuka.
8a	Side-looking sonar (surface)		No	
8b	Side-looking sonar (bottom)		No	
9	Photography or Video		No	
10	Heat Flow		Yes.	
11a	Magnetics		Yes	Compiled map published from AIST, Japan.
11b	Gravity		Yes	Compiled map published from AIST, Japan.
12	Sediment cores		No	
13	Rock sampling		No	
14a	Water current data			Available on JODC web page (http://www.jodc.go.jp)
14b	Ice Conditions			
15	OBS microseismicity		Yes	
16	Navigation		Yes	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

IODP Site Summary Forms:

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT1-03A	Date Form Submitted: Sept. 30, 2004
Water Depth (m): 4125	Sed. Penetration (m): 1200	Basement Penetration (m): 0

Do you need to use the conical side-entry sub (CSES) at this site? Yes □ No ■

Are high temperatures expected at this site? Yes □ No ■

Are there any other special requirements for logging at this site? Yes □ No ■

If "Yes" Please describe requirements: No logging planned. Site will have been logged in previous phase. CORK installation only

What do you estimate the total logging time for this site to be: 12 days (CORK/casing install)

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity		
Litho-Density		
Natural Gamma Ray		
Resistivity-Induction		
Acoustic		
FMS		
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)		
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	CORK	

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT1-03A	Date Form Submitted: Sept. 30, 2004

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	RCB with limited coring to confirm monitoring intervals for CORK. CORK installation
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	None
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	No
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	No
6	What "special" precautions will be taken during drilling?	May need shallow casing to to stabilize sandy turbidites.
7	What abandonment procedures do you plan to follow:	None. Holes will be CORKed.
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current. Typhoon season (June to Oct)
9	Summary: What do you consider the major risks in drilling at this site?	Current, instability of accreted trench turbidites.

IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ■ *Revised* □

New

Proposal #: 603D-Full	Site #: NT1-03A	Date Form Submitted: Sept. 30, 2004

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
seafloor			1.5	Hemipelagite + volcanic ash	Upper Shikoku Basin		
230	Fault	Quaternary	1.6-1.8	turbidites	Trench wedge		Probably contains thick layers of unconsolidated sands.
790	Reflector	Pleistocene	1.9	hemipelagite and volcanic ash	Upper Shikoku Basin		
1000	Reflector	Plio-Miocene	2.4	hemipelagite + turbidite	Lowe Shikoku Basin		Heterogeneous stratigraphy with irregular packets of sand or sandstone
1200	Total depth						

603D-Full2

IODP Site Summary Forms:

Form 1 - General Site Information

Please fill out information in all gray boxes
Revised 7 March 2002

New ■ **Revised** □

Section A: Proposal Information

Title of Proposal:	The Nankai Trough Seismogenic Zone Experiment: Observatory Science at the Reference Sites
Date Form Submitted:	Sept. 30, 2004
Site Specific Objectives with Priority (Must include general objectives in proposal)	One CORK hole with screened interval in turbidites and sealed basement. Companion CORK hole with fully cased sediment and open basement. Objectives are to document variations in turbidite and basement fluid flow between NT1-02A and deformation front.
List Previous Drilling in Area:	No scientific drilling in immediate vicinity. DSDP 87, ODP 131, 190, and 196 were conducted about 200 km SW of this proposal's sites.

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT1-05A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Nankai Trough off Kii
Latitude:	Deg: 33 N	Min: 01.3482	Jurisdiction:	Japan
Longitude:	Deg: 137 E	Min: 3.3432	Distance to Land:	120 km to Cape Shiono-Misaki
Coordinates System:	WGS 84,	Other ( )		
Priority of Site:	Primary:	Alt:x	Water Depth:	4310 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	1528	40
	What is the total sed. thickness? 1528 m	
	Total Penetration: 1568 m	
General Lithologies:	Possible silt/mud turbidites and ash layers Hemipelagic mud and mudstone	Basalt
Coring Plan: *(Specify or check)*	APC/XCB to refusal, RCB to TD.	
	1-2-3-APC ■ VPC* ☐ CB ■ DCB* ☐ CS ■ RCB Re☐try H☐B ☐	
	** Systems Currently Under Development*	

Wireline Logging Plan:

Standard Tools	Special Tools		LWD
Neutron-Porosity ■	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ■
Litho-Density ■	Nuclear Magnetic Resonance ☐	Borehole Temperature & Pressure ■	Resistivity-Gamma Ray ■
Gamma Ray ■	Geochemical ☐	Borehole Seismic ☐	Acoustic ■
Resistivity ■	Side-Wall Core Sampling ☐		
Acoustic ■			
Formation Image ■		Others ( )	Others ( )

Max.Borehole Temp. : *Expected value (For Riser Drilling)* _____°C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from _____ m to _____ m, _____ m intervals

from _____ m to _____ m, _____ m intervals

Basic Sampling Intervals: 5m

Estimated days:			
	Drilling/Coring: 18 days	Logging: 7 logging, 12 CORK/casing	Total On-Site: 37 days

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Long term monitoring (CORKs) of basement and overlying sediments.

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐
Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐
Shallow Water Flow ☐	Currents ■	Methane Hydrate ☐
Abnormal Pressure ☐	Fractured Zone ☐	Diapir and Mud Volcano ☐
Man-made Objects ☐	Fault ☐	High Temperature ☐
H_2S ☐	High Dip Angle ☐	Ice Conditions ☐
CO_2 ☐		

What is your Weather window? (Preferable period with the reasons)

April-July: Avoid typhoon season

Form 2 - Site Survey Detail

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* □

'roposal #: 603D-Full	Site #: NT1-05A	Date Form Submitted: Sept. 30, 2004

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		No	Primary Line(s) :Location of Site on line (SP or Time only) Crossing Lines(s):
2	Deep Penetration seismic reflection		Yes	Primary Line(s): KR9806-1 SP2922 Location of Site on line (SP or Time only) Crossing Lines(s): KY0314-100 SP 3558
3	Seismic Velocity†		Yes	Stacking velocity and migration velocity from MCS lines. OBS data.
4	Seismic Grid		Yes	
5a	Refraction (surface)		Yes	Two ship COP (maximum offset 20 km) obtained by JAMSTEC.
5b	Refraction (near bottom)		Yes	OBS data by Nakanishi et al. (1997)
6	3.5 kHz			Location of Site on line (Time)
7	Swath bathymetry		Yes	Multi-narrow-beam data by JAMSTEC R/V Yokusuka.
8a	Side-looking sonar (surface)		No	
8b	Side-looking sonar (bottom)		No	
9	Photography or Video		No	
10	Heat Flow		Yes.	
11a	Magnetics		Yes	Compiled map published from AIST, Japan.
11b	Gravity		Yes	Compiled map published from AIST, Japan.
12	Sediment cores		No	
13	Rock sampling		No	
14a	Water current data			Available on JODC web page (http://www.jodc.go.jp)
14b	Ice Conditions			
15	OBS microseismicity		Yes	
16	Navigation		Yes	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

IODP Site Summary Forms:

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT1-05A	Date Form Submitted: Sept. 30, 2004
Water Depth (m): 4310	Sed. Penetration (m): 1528	Basement Penetration (m): 40

Do you need to use the conical side-entry sub (CSES) at this site? Yes □ No ■

Are high temperatures expected at this site? Yes □ No ■

Are there any other special requirements for logging at this site? Yes □ No ■

If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be: 7 days logging, 12 days CORK/casing install

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content, bulk density, and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation of clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electromagnetic properties in sedimentary sequence and basement.	1
Acoustic	Determination of in situ velocity and estimation of physical properties. Comparsion with seismic velocity and create synthetic seismograms.	1
FMS	Imaging of sedimentary structures and fractures. Core-log correlation of structural features.	2
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents, bulk density and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents, electro-magnetic properties, and lithology in unstable borehole environment.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	Packer: hydrologic tests of sediment + basement VSP: core-log-seismic integration CORK: monitoring of sediment P, T, chem	1

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* ▭

Proposal #: 603D-Full	Site #: NT1-05A	Date Form Submitted: Sept. 30, 2004

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal, XCB to refusal. RCB to TD, log. CORK installation.
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	None
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	No
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	No
6	What "special" precautions will be taken during drilling?	May need casing of sandy turbidites prior to basement drilling/basement CORK installation.
7	What abandonment procedures do you plan to follow:	None. Holes will be CORKed.
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current. Typhoon season (June to Oct)
9	Summary: What do you consider the major risks in drilling at this site?	Current

IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ■ *Revised* ▭

New

Proposal #: 603D-Full	Site #: NT1-05A	Date Form Submitted: Sept. 30, 2004

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
seafloor			1.55-2.37	Hemipelagite and turbidites	Backarc basin Floor		Heterogeneous stratigraphy with irregular packets of turbidite sand.
1528	Unconformity	~20 Ma		Volcanic sediment and basement basalt	Backarc basin spreading ridge		
1568	Total depth						

iSAS/IODP Site Summary Forms:
Form 1 - General Site Information

Please fill out information in all gray boxes
Revised 7 March 2002

603D-Full2

New ■ **Revised** □

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Reference Sites: Sampling and Measuring Inputs to the Seismogenic Zone
Date Form Submitted:	3/31/05
Site Specific Objectives with Priority (Must include general objectives in proposal)	One CORK hole with screened interval in turbidites and sealed basement. Companion CORK hole with fully cased sediment and open basement. Reference site to characterize hydrology of Shikoku Basin strata and upper igneous crust where basement topography is relatively flat. Objectives are to document how stratigraphy, basement topography, and thermal structure affect the physical and hydrologic properties of subduction inputs.
List Previous Drilling in Area:	This site would be a return to NT1-06A, proposed as an alternate to NT1-02A from proposal 603A-Full2 (NantroSEIZE Reference Sites).

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT01-06A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Nankai Trough off Kii
Latitude:	Deg: 32 N	Min: 51.35	Jurisdiction:	Japan
Longitude:	Deg: 137 E	Min: 17.58	Distance to Land:	145 km to Cape Shiono-Misaki
Coordinates System:	WGS 84, Other ( )			
Priority of Site:	Primary:	Alt: X	Water Depth:	4200 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	990 m What is the total sed. thickness? 990 m	40 m
	Total Penetration: 1030 m	
General Lithologies:	Silt and sand turbidites, ash layers, hemipelagic mud and mudstone	Basalt
Coring Plan: *(Specify or check)*	Limited coring as necessary to confirm screen locations for CORKs 1-2-3-APC ☐ VPC* ☐ XCB ☐ MDCB* ☐ PCS ☐ RCB ☒ Re-entry ☐ HRGB ☐ ** Systems Currently Under Development*	

Wireline Logging Plan:	Standard Tools	Special Tools		LWD
	Neutron-Porosity ☐	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ☐
	Litho-Density ☐	Nuclear Magnetic Resonance ☐	Borehole Temperature & Pressure ☒	Resistivity-Gamma Ray ☐
	Gamma Ray ☐	Geochemical ☐	Borehole Seismic ☐	Acoustic ☐
	Resistivity ☐	Side-Wall Core Sampling ☐	Limited measurements if needed to fill gaps from previous (Phase I) drilling.	
	Acoustic ☐			
	Formation Image ☐		Others ( )	Others ( )

Max.Borehole Temp. :	**Expected value (For Riser Drilling)** ~~_____~~ °C	
Mud Logging: *(Riser Holes Only)*	Cuttings Sampling Intervals from ____ m to ____ m, ____ m intervals from ____ m to ____ m, ____ m intervals **Basic Sampling Intervals: 5m**	
Estimated days:	Drilling/Coring: 7 days	Logging: 12 days (casing/CORK) / Total On-Site: 19 days
Future Plan:	**Longterm Borehole Observation Plan/Re-entry Plan** CORK observatory	

Hazards/ Weather:	**Please check following List of Potential Hazards**			*What is your Weather window? (Preferable period with the reasons)*
	Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐	April-July : avoid typhoon season
	Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐	
	Shallow Water Flow ☐	Currents ☒	Methane Hydrate ☐	
	Abnormal Pressure ☐	Fractured Zone ☐	Diapir and Mud Volcano ☐	
	Man-made Objects ☐	Fault ☐	High Temperature ☐	
	H_2S ☐	High Dip Angle ☐	Ice Conditions ☐	
	CO_2 ☐			

iSAS/IODP Site Summary Forms:

Form 2 - Site Survey Detail

Please fill out information in all gray boxes

New ■ **Revised** □

'roposal #: 603A-Full	Site #: NT01-06A	Date Form Submitted: 11/05/04

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		Yes	Primary Line(s) :Location of Site on line (SP or Time only) odkm03-103-1 SP2860 Crossing Lines(s): odkm03-ACA SP2175
2	Deep Penetration seismic reflection		Yes	Primary Line(s): Location of Site on line (SP or Time only) KR9806-1 nearby Crossing Lines(s): KR0211-S0 nearby
3	Seismic Velocity†		Yes	Stacking velocity and migration velocity from MCS lines. OBS data
4	Seismic Grid		Yes	
5a	Refraction (surface)		Yes	Two ship COP (maximum offset 20 km) obtained by JAMSTEC at the end of September, 2002.
5b	Refraction (near bottom)		Yes	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		No	Location of Site on line (Time)
7	Swath bathymetry		Yes	Multi-narrow-beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		No	
8b	Side-looking sonar (bottom)		No	
9	Photography or Video		No	
10	Heat Flow		Yes	
11a	Magnetics		Yes	Compiled map published from AIST, Japan
11b	Gravity		Yes	Compiled map published from AIST, Japan
12	Sediment cores		No	
13	Rock sampling		No	
14a	Water current data			Available on JODC web page (http://www.jodc.go.jp)
14b	Ice Conditions			
15	OBS microseismicity		Yes	
16	Navigation		Yes	
17	Other			

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ■ **Revised** ☐

Proposal #: 603D-Full2	Site #: NT01-06A	Date Form Submitted: 3/31/05
Water Depth (m): 4200	Sed. Penetration (m): 990	Basement Penetration (m): 40

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ☒
Are high temperatures expected at this site? Yes ☐ No ☒
Are there any other special requirements for logging at this site? Yes ☐ No ☒
If "Yes" Please describe requirements: No logging planned. Site will have been logged in previous phase.

What do you estimate the total logging time for this site to be: 12 days casing CORK install

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	CORK	

iSAS/IODP Site Summary Forms:

Form 4 – Pollution & Safety Hazard Summary

Please fill out information in all gray boxes

New ■ **Revised** ☐

Proposal #: 603D-Full2	Site #: NT01-06A	Date Form Submitted: 3/31/05

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	RCB with limited coring to confirm monitoring intervals for CORK. CORK installation
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	None
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	No
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	No
6	What "special" precautions will be taken during drilling?	Standard monitoring of C_1 to C_n; shallow casing may be needed to stabilize shallow sandy turbidite layers.
7	What abandonment procedures do you plan to follow:	None. Will be CORKed.
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June to Oct.)
9	Summary: What do you consider the major risks in drilling at this site?	Kuroshio Current

Form 5 – Lithologic Summary

iSAS/IODP Site Summary Forms:

New ■ **Revised** ☐

Proposal #: 603D-Full2	Site #: NT01-06A	Date Form Submitted: 3/31/05

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
990	unconformity	Holocene to lower Miocene	1.6-1.9	Hemipelagite + volcanic ash + turbidites	backarc basin floor	36 m/My	Heterogeneous stratigraphy with irregular packets of turbidite sand
		20 Ma	2.0	volcanic sediment and basement basalt	backarc basin		

603D-Full2

IODP Site Summary Forms:

Form 1 - General Site Information

Please fill out information in all gray boxes
Revised 7 March 2002

New ■ **Revised** □

Section A: Proposal Information

Title of Proposal:	The Nankai Trough Seismogenic Zone Experiment: Observatory Science at the Reference Sites
Date Form Submitted:	Sept. 30, 2004
Site Specific Objectives with Priority (Must include general objectives in proposal)	CORK monitoring for material properties, strain, geochemistry seaward of deep riser hole (NT3-01). Monitoring intervals in clay-rich horizon (for strain) and in sandy horizon (for diffusive signal). Target depths will be refined based on prior drilling.
List Previous Drilling in Area:	This site would be a return to NT2-04A which is proposed to be drilled in 603B-Full2.

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT2-04A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Kumano Basin off Kii
Latitude:	Deg: 33 N	Min: 23.4	Jurisdiction:	Japan
Longitude:	Deg: 136 E	Min: 34.6'	Distance to Land:	60 km to Cape Shiono-Misaki
Coordinates System:	WGS 84, Other ( )			
Priority of Site:	Primary:x	Alt:	Water Depth:	1990 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	1400 What is the total sed. thickness? 1400 m	40
	Total Penetration: 1440 m	

General Lithologies: Forearc basin sediment unconformably laying on acoustic basin of Tertiary acc. Complex.

Coring Plan: *(Specify or check)*

Limited coring as necessary to confirm screen locations for CORKs

1-2-3-APC ☐ VPC* ☐ CB ☐ IDCB* ☐ PS ☐ RCB ☐ Re-entry ☐ HLAPC ☐

* *Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools	Special Tools		LWD
Neutron-Porosity ☐	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ☐
Litho-Density ☐	Nuclear Magnetic Resonance ☐	Borehole Temperature & Pressure ■	Resistivity-Gamma Ray ☐
Gamma Ray ☐	Geochemical ☐	Borehole Seismic ☐	Acoustic ☐
Resistivity ☐ ☐	Side-Wall Core Sampling ☐	Limited measurements if needed to ll gaps from previous (Phase I) rilling.	
Acoustic ☐ Formation Image		Others ( )	Others ( )

Max.Borehole Temp. : *Expected value (For Riser Drilling)* _____°C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from _____ m to _____ m, _____ m intervals

from _____ m to _____ m, _____ m intervals

Basic Sampling Intervals: 5m

Estimated days:

Drilling/Coring: 4	Logging: 6 casing/CORK install	Total On-Site: 10 days

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Long term monitoring (CORKs).

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐
Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐
Shallow Water Flow ☐	Currents ■	Methane Hydrate ■
Abnormal Pressure ☐	Fractured Zone ☐	Diapir and Mud Volcano ☐
Man-made Objects ☐	Fault ☐	High Temperature ☐
H_2S ☐	High Dip Angle ☐	Ice Conditions ☐
CO_2 ☐		

What is your Weather window? (Preferable period with the reasons)

April-July: Avoid typhoon season

Form 2 - Site Survey Detail

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* □

'roposal #: 603D-Full	Site #: NT2-04A	Date Form Submitted: Sept. 30, 2004

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		Yes	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line l Feb. 2003) Crossing Lines(s): JAMSTEC Line (Feb. 2003)
2	Deep Penetration seismic reflection		Yes	Primary Line(s): KR0108-4 Location of Site on line (SP or Time only) Crossing Lines(s):
3	Seismic Velocity†		Yes	Stacking velocity and migration velocity from MCS lines. OBS data.
4	Seismic Grid		Yes	
5a	Refraction (surface)		Yes	Two ship COP (maximum offset 20 km) obtained by JAMSTEC.
5b	Refraction (near bottom)		Yes	OBS data by Nakanishi et al. (1997)
6	3.5 kHz			Location of Site on line (Time)
7	Swath bathymetry		Yes	Multi-narrow-beam data by JAMSTEC R/V Yokusuka.
8a	Side-looking sonar (surface)		Yes	Some data collected using IZANAGI side scan sonar.
8b	Side-looking sonar (bottom)		No	
9	Photography or Video		Yes	Taken by JAMSTEC submersibles.
10	Heat Flow		Yes.	
11a	Magnetics		Yes	Compiled map published from AIST, Japan.
11b	Gravity		Yes	Compiled map published from AIST, Japan.
12	Sediment cores		Yes	Gravity and piston cores.
13	Rock sampling		No	
14a	Water current data			Available on JODC web page (http://www.jodc.go.jp)
14b	Ice Conditions			
15	OBS microseismicity		Yes	
16	Navigation		Yes	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

IODP Site Summary Forms:

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT2-04A	Date Form Submitted: Sept. 30, 2004
Water Depth (m): 1990	Sed. Penetration (m): 1400	Basement Penetration (m): 40

Do you need to use the conical side-entry sub (CSES) at this site? Yes □ No ■

Are high temperatures expected at this site? Yes □ No ■

Are there any other special requirements for logging at this site? Yes □ No ■

If "Yes" Please describe requirements: No logging planned. Site will have been logged in previous phase. CORK installation only

What do you estimate the total logging time for this site to be: 6 days (install casing/CORK)

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity		
Litho-Density		
Natural Gamma Ray		
Resistivity-Induction		
Acoustic		
FMS		
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)		
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	CORK	

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:
borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT2-04A	Date Form Submitted: Sept. 30, 2004

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	RCB with limited coring to confirm monitoring intervals for CORK to 1450 m. CORK installation
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	None
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSR.
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	No
6	What "special" precautions will be taken during drilling?	May need casing to to stabilize shallow sediments.
7	What abandonment procedures do you plan to follow:	None. Holes will be CORKed.
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current. Typhoon season (June to Oct)
9	Summary: What do you consider the major risks in drilling at this site?	Current, instability of shallow sediments.

IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ■ *Revised* □

New

Proposal #: 603D-Full	Site #: NT2-04A	Date Form Submitted: Sept. 30, 2004

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
seafloor		Holocene to Late tertiary	1.5-2	Turbidites and hemipelagic sediments	Forearc basin sediments		
1400	Unconformity						
1450	Total depth						

Received 1-October-2003

IODP Proposal Cover Sheet

603B-Full2

☐ **New** ☑ **Revised** ☐ **Addendum**

Please fill out information in all gray boxes

Above For Official Use Only

Title:	NanTroSEIZE Drilling and Observatory Phase 2 Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation
Proponent(s):	Masataka Kinoshita, Kevin Brown, Demian Saffer, Pierre Henry, Fred Chester, Tadanori Goto, Sean P. S. Gulick, Tetsuro Hirono, Hisao Ito, Aitaro Kato, Gaku Kimura, Achim Kopf, Gregory Moore, J. Casey Moore, Yasuyuki Nakamura, Jin-Oh Park, Saneatsu Saito, Susan Schwartz, Masanao Shinohara, Ralph Stephen, Harold Tobin, Kohtaro Ujiie, Urumu Tsunogai, and Makoto Yamano
Keywords: *(5 or less)*	Seismogenic zone, splay fault, tsunamigenesis, fault mechanics, fluid flow
Area:	Southwestern Japan margin

Contact Information:

Contact Person:	Masataka Kinoshita		
Department:	Deep-sea Research Department		
Organization:	Japan Marine Science and Technology Center		
Address	2-15 Natsushima, Yokosuka 237-0061 JAPAN		
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Permission to post abstract on iSAS Web site: ☑ Yes ☐ No

Abstract: (*400 words or less)*

The principal goal of NanTroSEIZE is to understand the mechanics of seismogenesis and rupture propagation along subduction plate boundary faults as stated in the accompanying CDP. At Nankai, large out-of-sequence-thrust faults (“mega-splays") that branch from the décollement are common, first order structural elements of the margin and appear continuous for several 10's of km along strike. These faults offset recent slope basin sediments, are characterized by seafloor scarps, and are commonly associated with active fluid venting. Off the Kii peninsula, such a mega-splay lies within the 1944 Tonankai coseismic rupture area estimated from tsunami and seismic waveform inversions; inversions cannot distinguish splay fault slip from décollement slip. Accordingly, both the décollement zone and the splay fault system represent necessary primary fault targets to address seismogenic zone processes.

The goal of this proposal is to (1) characterize the magnitude and nature of strain accumulation and slip along mega-splays off the Kii peninsula, and (2) sample and instrument the mega-splay fault system at a range of P-T conditions from ~1-3.5 km bsf. Specifically, this proposal is aimed at testing 5 key hypotheses: (1) The mega-splay is a significant locus of plate boundary slip, slips in seismogenic events, and is currently locked; (2) The mega-splay is part of a weak plate boundary fault system and slips at low resolved shear stress; (3) Changes in physical and chemical properties of the fault zone with increasing temperature and pressure cause slip along the mega-splay to undergo a transition from aseismic to seismic slip; (4) The mega-splay is hydrologically connected to the seismogenic décollement zone at great depths impacting its mechanical and chemical state, and (5) Physical properties, chemistry, and state of the fault zone change systematically during the interseismic period.

Proposed drilling includes (1) coring of 1 site in the Kumano Basin, focused on characterizing the tectonic history of the plate above the mega-splay faults, and (2) intersection of the active mega-splay fault system at three depths from ~1 to ~3.5 km bsf (down dip evolutionary studies). We propose installation of long-term borehole monitoring instruments at several of the sites. These borehole observatories, along with surface arrays of measurements, regional geodetic and seismic monitoring both on land and via offshore cabled observatories, will provide critical data toward understanding the slip distribution, temporal nature, and controlling mechanisms of seismogenic faulting along the plate boundary system.

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Scientific Objectives: (*250 words or less*)

To test the five principal hypotheses (above), 5 holes will be drilled utilizing a dense net work of 2D and 3D seismic reflection data. Comprehensive programs of coring, logging and downhole measurements will target the in-situ mega-splay and wall-rock structural architecture, fault properties, stress state, fluid pressure, and temperature. Post-drilling laboratory studies will include the fluid chemistry, veining/diagenesis, mechanical properties, and fault micro-fabric relationships. NT2 sites 1 through 3 will target the mega-splay fault at depths between ~ 1 and 3.5 km. They will assess evolutionary changes in all the various parameters over a temperature range of 20°C through ~100+ °C (Hypotheses 2 and 3). In addition, at NT2-01A and B sites (1km sites), closely-spaced, paired holes will allow extensive cross hole hydrologic and geophysical studies of the shallow fault-zone. Ultimately the 3.5 km site. NT2-3, will also be used for similar cross hole studies during the Phase 3 program. These cross hole tests, together with the fluid chemistry and vein studies, will constrain the down dip hydrologic connectivity of the fault system (Hypothesis 4). The NT2-04 site in the Kumano Basin, together with additional geological investigations along the splays fault traces, will allow us to constrain the mega-splays faulting activity (Hypothesis 1). At a minimum, Sites NT2-01A and NT2-03A will be instrumented for studies of the fault locking patterns (geodetic measurements), and long-term interactions of pore pressure, temperature, tilt and strain, seism city, fluid chemistry, and electrical properties during this interseismic period.

Please describe below any non-standard measurements technology needed to achieve the proposed scientific objectives.

LWD (RAB), DVTP-P, hydrofracturing test (wireline packer test), VSP.
Geodetic (strain/tilt), seismic and hydrologic (P,T) sensors and osmotic sampler are installed for a long-term borehole observatory at NT2-03A. Cross-well hydrologic (pumping / fluid injection test) and electrical propertiers experimentsare planned at NT2-01A and B.

Proposed Sites:

Site Name	Position	Water Depth (m)	Penetration (m)			Brief Site-specific Objectives
			Sed	Bsm	Total	
NT2-01A NT2-01B	33°13.0'N, 136°41.4'E	2470	1000	0	1000	Characterization of active splay fault and fluid flow regime by core sampling, logging, cross-hole experiments and long-term monitoring
NT2-02A	33°14.0'N, 136°40.8'E	2080	2000	0	2000	Study the progressive change in the fault properties by intersecting the splay fault at intermediate depth of 2km
NT2-03A	33°15.9'N, 136°39.5'E	2240	3500	0	3500	Study the progressive change in the fault properties by intersecting the splay fault at intermediate depth of 3.5km
NT2-04A	33°23.4'N, 136°34.6'E	1990	1400	300	1700	Total history of the splay fault through continuous coring the Kumano basin sediments and pilot drilling for riser platform
NT2-06A,B	33°06.6'N, 136°31.3'E	2990	1000	0	1000	Alternate site for NT2-01A,B
NT2-07A	33°08.6'N, 136°30.0'E	2260	2000	0	2000	Alternate site for NT2-02A
NT2-08A	33°10.8'N, 136°28.6'E	2170	3500	0	3500	Alternate site for NT2-03A

iSAS/IODP Site Summary Forms:

Form 1 - General Site Information

603B-Full2

Please fill out information in all gray boxes

Revised 7 March 2002

New ☐ **Revised** ☑

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 2 Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation
Date Form Submitted:	Oct. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Characterization of active splay fault and fluid flow regime by core sampling, logging, cross-hole experiments and long-term monitoring. Focuses are placed on mechanical and hydrological properties (e.g. strength, pore pressure, permeability, porosity), fluid budget, origin of the fluid, detection of episodic flow. Borehole long-term observatory for hydrogeological properties is planned as well as cross-hole experiment. Priority:2
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT2-01A/B	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 13.0 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 41.4 E	Distance to Land:	45 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary:	Alt:	Water Depth:	2.470 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	1000	0
	What is the total sed. thickness? >3,000 m	

Total Penetration: 700 m

General Lithologies: Upper section of splay faults, consisting of deformed, compacted turbidite

Coring Plan: *(Specify or Circle)*

1-2-3-APC ☑ VPC* ☐ XCB ☑ MDCB* ☐ PCS ☑ RCB ☑ Re-entry ☑ HRGB ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools		Special Tools				LWD	
Neutron-Porosity	☑	Borehole Televiewer	☐	Formation Fluid Sampling	☐	Density-Neutron	☑
Litho-Density	☑	Nuclear Magnetic Resonance	☑	Borehole Temperature & Pressure	☑	Resistivity-Gamma Ray	☑
Gamma Ray	☑	Geochemical	☐	Borehole Seismic	☐	Acoustic	☐
Resistivity	☑	Side-Wall Core Sampling	☐				
Acoustic	☐						
Formation Image	☑			Others ( )		Others (FMI)	

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 20 °C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from 200 m to 300 m, 5 m intervals

from 700 m to 900 m, 5 m intervals

Basic Sampling Intervals: 5m

Estimated days:

Drilling/Coring: 15	Logging: 5	Total On-Site: 40

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Geodetic (strain/tilt), seismic and hydrologic (P,T) sensors with casing (20 days)

Cross-hole experiments (5 days)

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas	☐	Complicated Seabed Condition	☐	Hydrothermal Activity	☐	*What is your Weather window? (Preferable period with the reasons)*
Hydrocarbon	☐	Soft Seabed	☐	Landslide and Turbidity Current	☐	May – August (typhoon risk in late August to September, then low pressure in November through March)
Shallow Water Flow	☐	Currents	☑	Methane Hydrate	☑	
Abnormal Pressure	☐	Fractured Zone	☐	Diapir and Mud Volcano	☐	
Man-made Objects	☑	Fault	☑	High Temperature	☐	
H_2S	☐	High Dip Angle	☐	Ice Conditions	☐	
CO_2	☐					

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

roposal #:	Site #: NT2-01A/B	Date Form Submitted: Oct. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-I (Feb. 2003) Crossing Lines(s): JAMSTEC Line-9 (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-4 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and migration velocity from MCS lines. OBS data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-erm monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity			Being processed now
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-01A/B	Date Form Submitted: Oct. 1, 2003
Water Depth (m): 2470	Sed. Penetration (m): 1000	Basement Penetration (m): 0

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ☑

Are high temperatures expected at this site? Yes ☐ No ☑

Are there any other special requirements for logging at this site? Yes ☐ No ☑

If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic		
FMS	Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	Cross-hole hydrologic and electrical experiment. RAB Hydrofracturing, Packer injection test CORK and Geodetic borehole observatory	1

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-01A/B	Date Form Submitted: Oct. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 1000 m
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct drilling in eastern Nankai in 2004. This datawill be used for ur program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	
6	What "special" precautions will be taken during drilling?	Yes, During drilling into the fault zone, hole may collapse.
7	What abandonment procedures do you plan to follow:	None
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-01A/B	Date Form Submitted: Oct. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
300 800	Unconformity fault	Holocene to Miocene	1.6-2.5km/s	Slope sediments to old accretionary rocks	Accretionary prism		

iSAS/IODP Site Summary Forms:

Form 1 - General Site Information

603B-Full2

Please fill out information in all gray boxes

Revised 7 March 2002

New ☐ Revised ☑

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 2 Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation
Date Form Submitted:	Oct. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Study the progressive change in the fault properties by intersecting the splay fault at intermediate depth of 2km. Integration with NT2-01A and NT2-03A are essential. Priority:2
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT2-02A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 14.0 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 40.8 E	Distance to Land:	45 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary:	Alt:	Water Depth:	2,080 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	2000	0
	What is the total sed. thickness? >3,000 m	
	Total Penetration:	1,700 m

General Lithologies: Slope basin sediment on top, fractured section across the splay fault, and underlying deformed, compacted turbidite

Coring Plan: *(Specify or Circle)*

1-2-3-APC ☑ VPC* ☐ XCB ☑ MDCB* ☐ PCS ☐ RCB ☑ Re-entry ☑ HRGB ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools	Special Tools		LWD
Neutron-Porosity ☑	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ☑
Litho-Density ☑	Nuclear Magnetic Resonance ☑	Borehole Temperature & Pressure ☑	Resistivity-Gamma Ray ☑
Gamma Ray ☑	Geochemical ☐	Borehole Seismic ☐	Acoustic ☐
Resistivity ☑	Side-Wall Core Sampling ☐		
Acoustic ☐			
Formation Image ☑		Others ( )	Others (FMI)

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 40-60 °C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from 300 m to 500 m, 5 m intervals

from 1700 m to 1900 m, 5 m intervals

Basic Sampling Intervals: 5m

Estimated days: Drilling/Coring: 25 | Logging: 10 | Total On-Site: 35

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐
Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐
Shallow Water Flow ☐	Currents ☑	Methane Hydrate ☑
Abnormal Pressure ☐	Fractured Zone ☐	Diapir and Mud Volcano ☐
Man-made Objects ☑	Fault ☑	High Temperature ☐
H_2S ☐	High Dip Angle ☐	Ice Conditions ☐
CO_2 ☐		

What is your Weather window? (Preferable period with the reasons)

May – August (typhoon risk in late August to September, then low pressure in November through March)

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

roposal #:	Site #: NT2-02A	Date Form Submitted: Oct. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-I (Feb. 2003) Crossing Lines(s): JAMSTEC Line-9 (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-4 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and migration velocity from MCS lines. OBS data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-erm monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity			Being processed now
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-02A	Date Form Submitted: Oct. 1, 2003
Water Depth (m): 2080	Sed. Penetration (m): 2000	Basement Penetration (m): 0

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ☑

Are high temperatures expected at this site? Yes ☐ No ☑

Are there any other special requirements for logging at this site? Yes ☐ No ☑

If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic		
FMS	Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	RAB preferred	2

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-02A	Date Form Submitted: Oct. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 2000 m
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct drilling in eastern Nankai in 2004. This datawill be used for ur program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	
6	What "special" precautions will be taken during drilling?	Yes, During drilling into the fault zone, hole may collapse.
7	What abandonment procedures do you plan to follow:	None
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-02A	Date Form Submitted: Oct. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
400 1800	Unconformity fault	Holocene to Miocene	1.6-2.5km/s	Slope sediments to old accretionary rocks	Accretionary prism		

iSAS/IODP Site Summary Forms:

603B-Full2

Form 1 - General Site Information

Please fill out information in all gray boxes

Revised 7 March 2002

New ☐ **Revised** ☑

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 2 Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation
Date Form Submitted:	Oct. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Study the progressive change in the fault properties by intersecting the splay fault at intermediate depth of 3.5km. Integration with NT2-01A and NT2-02A are essential. Priority:1
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT2-03A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 15.9 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 39.5 E	Distance to Land:	45 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary:	Alt:	Water Depth:	2,240 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	3500	0
	What is the total sed. thickness? >3,000 m	
	Total Penetration: 2,200 m	

General Lithologies: Slope basin sediment on top, fractured section across the splay fault, and underlying deformed, compacted turbidite

Coring Plan: *(Specify or Circle)*

Continuous coring may be replaced with ordinary/LWD logging.

1-2-3-APC ☑ VPC* ☐ XCB ☑ MDCB* ☐ PCS ☐ RCB ☑ Re-entry ☑ HRGB ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools		Special Tools		LWD	
Neutron-Porosity	☑	Borehole Televiewer	☐	Formation Fluid Sampling	☐	Density-Neutron	☑
Litho-Density	☑	Nuclear Magnetic Resonance	☑	Borehole Temperature & Pressure	☑	Resistivity-Gamma Ray	☑
Gamma Ray	☑	Geochemical	☐	Borehole Seismic	☐	Acoustic	☐
Resistivity	☑	Side-Wall Core Sampling	☐				
Acoustic	☐						
Formation Image	☑			Others ( )		Others (FMI)	

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 80-100 °C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from 1700 m to 1900 m, 5 m intervals

from 3300 m to 3500 m, 5 m intervals

Basic Sampling Intervals: 5m

Estimated days:

Drilling/Coring: 130	Logging: 20	Total On-Site: 250

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Geodetic (strain/tilt), seismic and hydrologic (P,T) sensors (100 days?)

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas	☐	Complicated Seabed Condition	☐	Hydrothermal Activity	☐
Hydrocarbon	☐	Soft Seabed	☐	Landslide and Turbidity Current	☐
Shallow Water Flow	☐	Currents	☑	Methane Hydrate	☑
Abnormal Pressure	☐	Fractured Zone	☐	Diapir and Mud Volcano	☐
Man-made Objects	☑	Fault	☑	High Temperature	☐
H_2S	☐	High Dip Angle	☐	Ice Conditions	☐
CO_2	☐				

What is your Weather window? (Preferable period with the reasons)

May – August (typhoon risk in late August to September, then low pressure in November through March)

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

roposal #:	Site #: NT2-03A	Date Form Submitted: Oct. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-I (Feb. 2003) Crossing Lines(s): JAMSTEC Line-9 (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-4 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and migration velocity from MCS lines. OBS data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-erm monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity			Being processed now
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-03A	Date Form Submitted: Oct. 1, 2003
Water Depth (m): 2240	Sed. Penetration (m): 3500	Basement Penetration (m): 0

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ☑

Are high temperatures expected at this site? Yes ☐ No ☑

Are there any other special requirements for logging at this site? Yes ☐ No ☑

If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic		
FMS	Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	RAB, VSP Hydrofracturing, Packer injection test CORK and Geodetic/Seismic borehole observatory	1

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-03A	Date Form Submitted: Oct. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 3500 m
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct drilling in eastern Nankai in 2004. This datawill be used for ur program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	
6	What "special" precautions will be taken during drilling?	Yes, During drilling into the fault zone, hole may collapse.
7	What abandonment procedures do you plan to follow:	None
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-03A	Date Form Submitted: Oct. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
300 1800 3400	Unconformity Fault fault	Holocene to Miocene	1.6-2.5km/s	Slope sediments to old accretionary rocks	Accretionary prism		

iSAS/IODP Site Summary Forms:

Form 1 - General Site Information

603B-Full2

Please fill out information in all gray boxes

Revised 7 March 2002

New ☐ Revised ☑

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 2 Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation
Date Form Submitted:	Oct. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Total history of the splay fault system through continuous coring the Kumano foreac basin sediments: Objective 1 is the primary target of this site. Total history of the splay fault system is depicted by integrating the results from NT1b-05A as a reference for this site. Drilling the underlying acoustic basement is planned to clarify the structure of pst accretionary complex, but is also used as a pilot drilling for the future riser-based proposal. Priority:4
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT2-04A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 23.4 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 34.6 E	Distance to Land:	37 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary:	Alt:	Water Depth:	1,990 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	1,400	300
	What is the total sed. thickness? 1,400 m	
	Total Penetration: 1,700 m	

General Lithologies: Forearc basin sediment with unconformity laying on acoustic basement of Tertially accretionary complex

Coring Plan: *(Specify or Circle)*

1-2-3-APC ☑ VPC* ☐ XCB ☑ MDCB* ☐ PCS ☐ RCB ☑ Re-entry ☐ HRGB ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools	Special Tools		LWD
Neutron-Porosity ☑	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ☐
Litho-Density ☑	Nuclear Magnetic Resonance ☑	Borehole Temperature & Pressure ☑	Resistivity-Gamma Ray ☐
Gamma Ray ☑	Geochemical ☐	Borehole Seismic ☐	Acoustic ☐
Resistivity ☑	Side-Wall Core Sampling ☐		
Acoustic ☐			
Formation Image ☑		Others ( )	Others (FMI)

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 70 °C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from _____ m to _____ m, _____ m intervals

from _____ m to _____ m, _____ m intervals

Basic Sampling Intervals: 5m

Estimated days: Drilling/Coring: 15 | Logging: 3 | Total On-Site: 18

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐
Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐
Shallow Water Flow ☐	Currents ☑	Methane Hydrate ☑
Abnormal Pressure ☐	Fractured Zone ☐	Diapir and Mud Volcano ☐
Man-made Objects ☑	Fault ☑	High Temperature ☐
H_2S ☐	High Dip Angle ☐	Ice Conditions ☐
CO_2 ☐		

What is your Weather window? (Preferable period with the reasons)

May – August (typhoon risk in late August to September, then low pressure in November through March)

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

roposal #:	Site #: NT2-04A	Date Form Submitted: Oct. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-I (Feb. 2003) Crossing Lines(s): JAMSTEC Line (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-4 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and migration velocity from MCS lines. OBS data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-erm monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity			Being processed now
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ☑ *Revised* ☐

Proposal #:	Site #: NT2-04A	Date Form Submitted: Oct. 1, 2003
Water Depth (m): 1990	Sed. Penetration (m): 1400	Basement Penetration (m): 300

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ☑

Are high temperatures expected at this site? Yes ☐ No ☑

Are there any other special requirements for logging at this site? Yes ☐ No ☑

If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic		
FMS	Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)	.	
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP		

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-04A	Date Form Submitted: Oct. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 1700 m
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct drilling in eastern Nankai in 2004. This datawill be used for ur program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	
6	What "special" precautions will be taken during drilling?	Yes, During drilling into the fault zone, hole may collapse.
7	What abandonment procedures do you plan to follow:	None
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-04A	Date Form Submitted: Oct. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
1400	Unconformity	Holocene to late Tertiary	1.5-2.0km/s	Turbidite & hemipelagic sediments	Forearc basin		Fan deposits?

iSAS/IODP Site Summary Forms:

Form 1 - General Site Information

603B-Full2

Please fill out information in all gray boxes

Revised 7 March 2002

New ☐ **Revised** ☑

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 2 Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation
Date Form Submitted:	Oct. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Characterization of active splay fault and fluid flow regime by core sampling, logging, cross-hole experiments and long-term monitoring. Focuses are placed on mechanical and hydrological properties (e.g. strength, pore pressure, permeability, porosity), fluid budget, origin of the fluid, detection of episodic flow. Borehole long-term observatory for hydrogeological properties is planned as well as cross-hole experiment. Priority:3 (Alternate site for NT2-01A/B)
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT2-06A/B	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 06.6 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 31.3 E	Distance to Land:	45 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary:	Alt:	Water Depth:	2.990 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	1000	0
	What is the total sed. thickness? >3,000 m	

Total Penetration: 700 m

General Lithologies: Upper section of splay faults, consisting of deformed, compacted turbidite

Coring Plan: *(Specify or Circle)*

1-2-3-APC ☑ VPC* ☐ XCB ☑ MDCB* ☐ PCS ☑ RCB ☑ Re-entry ☑ HRGB ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools		Special Tools				LWD	
Neutron-Porosity	☑	Borehole Televiewer	☐	Formation Fluid Sampling	☐	Density-Neutron	☑
Litho-Density	☑	Nuclear Magnetic Resonance	☑	Borehole Temperature & Pressure	☑	Resistivity-Gamma Ray	☑
Gamma Ray	☑	Geochemical	☐	Borehole Seismic	☐	Acoustic	☐
Resistivity	☑	Side-Wall Core Sampling	☐				
Acoustic	☐						
Formation Image	☑			Others ( )		Others (FMI)	

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 20 °C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from 200 m to 300 m, 5 m intervals

from 700 m to 900 m, 5 m intervals

Basic Sampling Intervals: 5m

Estimated days:

Drilling/Coring: 15	Logging: 5	Total On-Site: 40

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Geodetic (strain/tilt), seismic and hydrologic (P,T) sensors with casing (20 days)

Cross-hole experiments (5 days)

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas	☐	Complicated Seabed Condition	☐	Hydrothermal Activity	☐	*What is your Weather window? (Preferable period with the reasons)*	
Hydrocarbon	☐	Soft Seabed	☐	Landslide and Turbidity Current	☐	May – August (typhoon risk in late August to September, then low pressure in November through March)	
Shallow Water Flow	☐	Currents	☑	Methane Hydrate	☑		
Abnormal Pressure	☐	Fractured Zone	☐	Diapir and Mud Volcano	☐		
Man-made Objects	☑	Fault	☑	High Temperature	☐		
H_2S	☐	High Dip Angle	☐	Ice Conditions	☐		
CO_2	☐						

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

roposal #:	Site #: NT2-06A/B	Date Form Submitted: Oct. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-I (Feb. 2003) Crossing Lines(s): JAMSTEC Line-9 (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-4 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and migration velocity from MCS lines. OBS data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-erm monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity			Being processed now
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-06A/B	Date Form Submitted: Oct. 1, 2003
Water Depth (m): 2990	Sed. Penetration (m): 1000	Basement Penetration (m): 0

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ☑

Are high temperatures expected at this site? Yes ☐ No ☑

Are there any other special requirements for logging at this site? Yes ☐ No ☑

If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic		
FMS	Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	Cross-hole hydrologic and electrical experiment. RAB Hydrofracturing, Packer injection test CORK and Geodetic borehole observatory	1

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-06A/B	Date Form Submitted: Oct. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 1000 m
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct drilling in eastern Nankai in 2004. This datawill be used for ur program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	
6	What "special" precautions will be taken during drilling?	Yes, During drilling into the fault zone, hole may collapse.
7	What abandonment procedures do you plan to follow:	None
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-06A/B	Date Form Submitted: Oct. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
300 800	Unconformity fault	Holocene to Miocene	1.6-2.5km/s	Slope sediments to old accretionary rocks	Accretionary prism		

iSAS/IODP Site Summary Forms:

Form 1 - General Site Information

603B-Full2

Please fill out information in all gray boxes

Revised 7 March 2002

New ☐ **Revised** ☑

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 2 Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation
Date Form Submitted:	Oct. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Study the progressive change in the fault properties by intersecting the splay fault at intermediate depth of 2km. Integration with NT2-01A and NT2-03A are essential. Priority:2 (Alternate site for NT2-02A)
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT2-07A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 08.6 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 30.0 E	Distance to Land:	45 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary:	Alt:	Water Depth:	2,260 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	2000	0
	What is the total sed. thickness? >3,000 m	
	Total Penetration: 1,700 m	

General Lithologies: Slope basin sediment on top, fractured section across the splay fault, and underlying deformed, compacted turbidite

Coring Plan: *(Specify or Circle)*

1-2-3-APC ☑ VPC* ☐ XCB ☑ MDCB* ☐ PCS ☐ RCB ☑ Re-entry ☑ HRGB ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools	Special Tools		LWD
Neutron-Porosity ☑	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ☑
Litho-Density ☑	Nuclear Magnetic Resonance ☑	Borehole Temperature & Pressure ☑	Resistivity-Gamma Ray ☑
Gamma Ray ☑	Geochemical ☐	Borehole Seismic ☐	Acoustic ☐
Resistivity ☑	Side-Wall Core Sampling ☐		
Acoustic ☐			
Formation Image ☑		Others ( )	Others (FMI)

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 40-60 °C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from 300 m to 500 m, 5 m intervals

from 1700 m to 1900 m, 5 m intervals

Basic Sampling Intervals: 5m

Estimated days: Drilling/Coring: 25 | Logging: 10 | Total On-Site: 35

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐
Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐
Shallow Water Flow ☐	Currents ☑	Methane Hydrate ☑
Abnormal Pressure ☐	Fractured Zone ☐	Diapir and Mud Volcano ☐
Man-made Objects ☑	Fault ☑	High Temperature ☐
H_2S ☐	High Dip Angle ☐	Ice Conditions ☐
CO_2 ☐		

What is your Weather window? (Preferable period with the reasons)

May – August (typhoon risk in late August to September, then low pressure in November through March)

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

roposal #:	Site #: NT2-07A	Date Form Submitted: Oct. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-I (Feb. 2003) Crossing Lines(s): JAMSTEC Line-9 (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-4 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and migration velocity from MCS lines. OBS data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-erm monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity			Being processed now
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-07A	Date Form Submitted: Oct. 1, 2003
Water Depth (m): 2260	Sed. Penetration (m): 2000	Basement Penetration (m): 0

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ☑

Are high temperatures expected at this site? Yes ☐ No ☑

Are there any other special requirements for logging at this site? Yes ☐ No ☑

If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic		
FMS	Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	RAB preferred	2

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-07A	Date Form Submitted: Oct. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 2000 m
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct drilling in eastern Nankai in 2004. This datawill be used for ur program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	
6	What "special" precautions will be taken during drilling?	Yes, During drilling into the fault zone, hole may collapse.
7	What abandonment procedures do you plan to follow:	None
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-07A	Date Form Submitted: Oct. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
400 1800	Unconformity fault	Holocene to Miocene	1.6-2.5km/s	Slope sediments to old accretionary rocks	Accretionary prism		

iSAS/IODP Site Summary Forms:

603B-Full2

Form 1 - General Site Information

Please fill out information in all gray boxes

Revised 7 March 2002

New ☐ **Revised** ☑

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 2 Mechanical and Hydrologic State of Mega-Splay Faults: Implications for Seismogenic Faulting and Tsunami Generation
Date Form Submitted:	Oct. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Study the progressive change in the fault properties by intersecting the splay fault at intermediate depth of 3.5km. Integration with NT2-01A and NT2-02A are essential. Priority:1 (Alternate site for NT2-03A)
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT2-08A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 10.8 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 28.6 E	Distance to Land:	45 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary:	Alt:	Water Depth:	2,170 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	3500	0
	What is the total sed. thickness? >3,000 m	
	Total Penetration: 2,200 m	

General Lithologies: Slope basin sediment on top, fractured section across the splay fault, and underlying deformed, compacted turbidite

Coring Plan: *(Specify or Circle)*

Continuous coring may be replaced with ordinary/LWD logging.

1-2-3-APC ☑ VPC* ☐ XCB ☑ MDCB* ☐ PCS ☐ RCB ☑ Re-entry ☑ HRGB ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools		Special Tools				LWD	
Neutron-Porosity	☑	Borehole Televiewer	☐	Formation Fluid Sampling	☐	Density-Neutron	☑
Litho-Density	☑	Nuclear Magnetic Resonance	☑	Borehole Temperature & Pressure	☑	Resistivity-Gamma Ray	☑
Gamma Ray	☑	Geochemical	☐	Borehole Seismic	☐	Acoustic	☐
Resistivity	☑	Side-Wall Core Sampling	☐				
Acoustic	☐						
Formation Image	☑			Others ( )		Others (FMI)	

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 80-100 °C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from 1700 m to 1900 m, 5 m intervals

from 3300 m to 3500 m, 5 m intervals

Basic Sampling Intervals: 5m

Estimated days:

Drilling/Coring: 130	Logging: 20	Total On-Site: 250

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Geodetic (strain/tilt), seismic and hydrologic (P,T) sensors (100 days?)

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas	☐	Complicated Seabed Condition	☐	Hydrothermal Activity	☐
Hydrocarbon	☐	Soft Seabed	☐	Landslide and Turbidity Current	☐
Shallow Water Flow	☐	Currents	☑	Methane Hydrate	☑
Abnormal Pressure	☐	Fractured Zone	☐	Diapir and Mud Volcano	☐
Man-made Objects	☑	Fault	☑	High Temperature	☐
H_2S	☐	High Dip Angle	☐	Ice Conditions	☐
CO_2	☐				

What is your Weather window? (Preferable period with the reasons)

May – August (typhoon risk in late August to September, then low pressure in November through March)

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

roposal #:	Site #: NT2-08A	Date Form Submitted: Oct. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-I (Feb. 2003) Crossing Lines(s): JAMSTEC Line-9 (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-4 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and migration velocity from MCS lines. OBS data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-erm monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity			Being processed now
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-08A	Date Form Submitted: Oct. 1, 2003
Water Depth (m): 2170	Sed. Penetration (m): 3500	Basement Penetration (m): 0

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ☑

Are high temperatures expected at this site? Yes ☐ No ☑

Are there any other special requirements for logging at this site? Yes ☐ No ☑

If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic		
FMS	Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	RAB, VSP Hydrofracturing, Packer injection test CORK and Geodetic/Seismic borehole observatory	1

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-08A	Date Form Submitted: Oct. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 3500 m
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct drilling in eastern Nankai in 2004. This datawill be used for ur program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	
6	What "special" precautions will be taken during drilling?	Yes, During drilling into the fault zone, hole may collapse.
7	What abandonment procedures do you plan to follow:	None
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ☐ *Revised* ☑

Proposal #:	Site #: NT2-08A	Date Form Submitted: Oct. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
300 1800 3400	Unconformity Fault fault	Holocene to Miocene	1.6-2.5km/s	Slope sediments to old accretionary rocks	Accretionary prism		

Received 1 April 2004

IODP Proposal Cover Sheet

603C-Full

☑ New ☐ Revised ☐ Addendum

Above For Official Use Only

Please fill out information in all gray boxes

Title:	**NanTroSEIZE Drilling and Observatory Phase 3: A Window into the Seismogenic Zone**		
Proponent(s):	**Kiyoshi Suyehiro, Harold Tobin, Eiichiro Araki, Susan Bilek, Tadanori Goto, Pierre Henry, Gaku Kimura, Aitaro Kato, Masa Kinoshita, Chris Marone, Greg Moore, J. Casey Moore, Demian Saffer, Arito Sakaguchi, Masanao Shinohara, Ralph Stephen, Akito Tsutsumi, Kohtaro Ujiie, Kelin Wang**		
Keywords: *(5 or less)*	**Seismogenic zone, fault mechanics, borehole observatory, tsunamigenesis**	Area:	**Southwestern Japan margin**

Contact Information:

Contact Person:	**Harold Tobin**		
Department:	**Earth and Environmental Science Department**		
Organization:	**New Mexico Tech**		
Address	**Socorro, NM 87801 USA**		
Tel.:	**505-835-5920**	Fax:	**505-835-6436**
E-mail:	**tobin@nmt.edu**		

Permission to post abstract on iSAS Web site: ☑ Yes ☐ No

Abstract: (*400 words or less)*

The principal goal of NanTroSEIZE is to understand seismogenesis and rupture propagation along subduction plate boundary faults by direct testing of key hypotheses related to the mechanics of subduction megathrusts. **NanTroSEIZE Phase 3 represents the culmination of the Seismogenic Zone Initiative: drilling into, sampling, and monitoring of the subduction zone plate interface at depths of coseismic slip.** This proposal centers on the deepest drilling effort in the NanTroSEIZE project: sampling a single site across the entire plate interface into the top of the subducting Philippine Sea plate. The proposed borehole will penetrate a major splay fault (~4 km bsf) potentially implicated in coseismic slip, as well as the master decollement (~6 km bsf), at a location of shallow large slip during the 1944 Tonankai Mw 8.2 earthquake.

The goal of this proposal is to address two key questions by a combination of logging, coring, down-hole experiments, and long-term monitoring:

(1) What controls the nature of fault slip and its spatial variability (i.e. the updip transition from aseismic to seismogenic slip)?

(2) What processes control temporal changes in slip behavior on a given fault?

Specifically, this proposal is aimed at testing hypotheses explaining controls on unstable slip, and documenting the roles of fault zone state (stress, fluid pressure, fabric) and composition in controlling frictional rheology. Down-hole and monitoring observations, core analyses, and post-cruise laboratory studies will provide direct tests of existing hypothesis for fault zone frictional behavior. One focus of Phase 3 will be on documenting the material properties and ambient conditions at each of the two faults, and comparing results with findings from shallower portions of the plate boundary system sampled during Phases 1 and 2 to rigorously characterize controls on fault slip behavior in an active megathrust system.

Proposed activities include (1) drilling, LWD, and casing of a main hole - with drillstem tests performed at casing set points, (2) creation of a sidetrack coring hole with continuous coring from 4000-6200 mbsf, and (3) well tests in perforated casing and installation of an observatory system for continuous monitoring of pore fluid pressure, temperature, strain, tilt, and seismicity. The borehole observatories, along with surface arrays of measurements, and regional geodetic and seismic monitoring, will provide critical data toward understanding the slip distribution, temporal variability, and controlling mechanisms of seismogenic faulting along the plate boundary system.

603C-Full

Scientific Objectives: (*250 words or less*)

The scientific objectives of NanTroSEIZE Phase 3 drilling are to use *direct observation* to rigorously evaluate the following hypotheses, which are central to understanding earthquake mechanics along subduction megathrusts:

(1) Systematic, progressive material and state changes control the onset of seismogenic behavior on subduction thrusts; (2) Subduction zone megathrusts are weak faults; (3) Within the seismogenic zone, relative plate motion is primarily accommodated by coseismic frictional slip in a concentrated zone; (4) Physical properties, chemistry, and state of the fault zone change systematically with time throughout the earthquake cycle; and (5) The mega-splay (OOST) thrust fault system slips in discrete events which may include tsunamigenic slip during great earthquakes. These hypotheses will be evaluated by detailed characterization – in fault zones and in the surrounding rock volume – of the lithology, structural geology, and physical properties of the rock; the geochemistry of pore fluids; the microbiological activity; the distribution of temperature, stress, and pore fluid pressure in space and time; the seismicity in the near-borehole environment and downdip; the temporal evolution of the strain field; and the evolution of physical properties in the volume around the borehole.

Please describe below any non-standard measurements technology needed to achieve the proposed scientific objectives.

Essentially all technologies to be used are non-standard. These will include, but are not limited to:
Riser-based drilling, LWD suite, DVTP-P, active hydrofracturing tests (wireline packer test), VSP.
A borehole observatory with multi-level packers and perforated intervals, Geodetic (strain/tilt), seismic and hydrologic (P,T) sensors and other instruments will be installed for a long-term borehole observatory.

Proposed Sites:

Site Name	Position	Water Depth (m)	Penetration (m)			Brief Site-specific Objectives
			Sed	Bsm	Total	
NT3-01A	33°17.6'N, 136°38.6'E	1950	6000	200	6200	Study the progressive change in the fault properties by intersecting the splay fault at ~4.5km and the seismogenic fault at 5.8 to 6km depth
NT3-02A	33°12.9'N, 136°27.4'E	2100	6000	200	6200	Alternate site for NT3-01A

iSAS/IODP Site Summary Forms:
Form 1 - General Site Information

Please fill out information in all gray boxes
Revised 7 March 2002

603C-Full

New ✓ **Revised**

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 3: A Window into the Seismogenic Zone
Date Form Submitted:	Apr. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Sample and instrument decollement, mega-splay, and wall rock of lower prism to address fault rheology, slip history, and temporal change objectives. Priority:1
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT3-01A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 17.6 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 38.6 E	Distance to Land:	45 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary: X	Alt:	Water Depth:	1,950 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	5800 - 6000	200
	What is the total sed. thickness? >5,500 m	
	Total Penetration: 6,200 m	

General Lithologies: Slope basin clastic sediments, accreted and deformed trench turbidites, hemipelagic and pelagic mudstones, pillow basalt.

Coring Plan: *(Specify or Circle)*

Continuous coring may be replaced with LWD logging in intervals

1-2-3-APC ☑ HPC* XCB ☑ MDCB* PCS ☑ RCB Re-entry HRGB ☐ ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools		Special Tools				LWD	
Neutron-Porosity	☑	Borehole Televiewer	☐	Formation Fluid Sampling	☑	Density-Neutron	☑
Litho-Density	☑	Nuclear Magnetic Resonance	☑	Borehole Temperature & Pressure	☑	Resistivity-Gamma Ray	☑
Gamma Ray	☑	Geochemical	☐	Borehole Seismic	☑	Acoustic	☑
Resistivity	☑	Side-Wall Core Sampling	☐				
Acoustic	☑						
Formation Image	☑			Others ( )		Others (FMI)	☑

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 150-170 degC

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from 1500 m to 3600 m, 5 m intervals

from 4300 m to 6200 m, 5 m intervals

Basic Sampling Intervals: 5m

Estimated days: Drilling/Coring: ??? | Logging: ?? | Total On-Site: ???

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Long-term observatory installation and data telemetry/recording

Hazards/ Weather:

Please check following List of Potential Hazards

						What is your Weather window? (Preferable period with the reasons)
Shallow Gas	☐	Complicated Seabed Condition	☐	Hydrothermal Activity	☐	May – August optimal (typhoon risk in late August to September)
Hydrocarbon	☐	Soft Seabed	☐	Landslide and Turbidity Current	☐	
Shallow Water Flow	☐	Currents	☑	Methane Hydrate	☑	
Abnormal Pressure	☐	Fractured Zone	☐	Diapir and Mud Volcano	☐	
Man-made Objects	☑	Fault	☑	High Temperature	☐	
H_2S	☐	High Dip Angle	☐	Ice Conditions	☐	
CO_2	☐					

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☑ *Revised* ☐

Proposal #:	Site #: NT3-01A	Date Form Submitted: Apr. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-L (Feb. 2003) Crossing Lines(s): JAMSTEC Line-9 (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-5 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and PODM migration velocity from MCS lines. OBS wide-angle data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003, also IFREE lines from 1998 - 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-term monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity		YES	Obana et al., in press
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ✓ *Revised* ☐

Proposal #:	Site #: NT3-01A	Date Form Submitted: Apr. 1, 2003
Water Depth (m): 1950	Sed. Penetration (m): 6000	Basement Penetration (m): 200

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ✓
Are high temperatures expected at this site? Yes ✓ No
Are there any other special requirements for logging at this site? Yes ☐ No ✓
If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic	Yes, dipole sonic, LWD sonic for physical properties	
FMS	Preferably FMI & RAB. Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV	Perhaps?	
Resistivity-Laterolog	LWD resistivity	
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	RAB, VSP Hydrofracturing, Packer injection test Geodetic/Seismic and multi-level packer borehole observatory	1

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:
borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

iSAS/IODP Site Summary Forms:

Form 4 – Pollution & Safety Hazard Summary

Please fill out information in all gray boxes

New ✓ *Revised* ☐

Proposal #:	Site #: NT3-01A	Date Form Submitted: Apr. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 6200 m or 200 m into basement.
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct BSR drilling in eastern Nankai in 2004. This data will be used for our program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	Except for normal gas hydrate occurrence, none.
6	What "special" precautions will be taken during drilling?	Fault zones are likely unstable and overpressured, prone to collapse, possible pressure kicks.
7	What abandonment procedures do you plan to follow:	Unknown at this time for riser operations
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current, shallow overpressure (but latter is probably not major

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

Proposal #:	Site #: NT3-01A	Date Form Submitted: Apr. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
200 1000 4500 6000	Unconformity Unconformity Fault fault	Holocene to Miocene	1.6-2.5km/s	Slope sediments to old accretionary rocks	Accretionary prism		

iSAS/IODP Site Summary Forms:
Form 1 - General Site Information

Please fill out information in all gray boxes
Revised 7 March 2002

603C-Full

New ✓ **Revised**

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Drilling and Observatory Phase 3: A Window into the Seismogenic Zone
Date Form Submitted:	Apr. 1, 2003
Site Specific Objectives with Priority (Must include general objectives in proposal)	Sample and instrument decollement, mega-splay, and wall rock of lower prism to address fault rheology, slip history, and temporal change objectives. Priority:2
List Previous Drilling in Area:	None

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT3-02A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Southwestern Nankai Trough off Kumano
Latitude:	Deg: 33	Min: 12.9 N	Jurisdiction:	Within Japanese EEZ
Longitude:	Deg: 136	Min: 27.4 E	Distance to Land:	45 NM
Coordinates System:	WGS 84			
Priority of Site:	Primary: X	Alt: X	Water Depth:	1,950 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	5800 - 6000	200
	What is the total sed. thickness? >5,500 m	
	Total Penetration: 6,200 m	

General Lithologies: Slope basin clastic sediments, accreted and deformed trench turbidites, hemipelagic and pelagic mudstones, pillow basalt.

Coring Plan: *(Specify or Circle)*

Continuous coring may be replaced with LWD logging in intervals

1-2-3-APC ☑ HPC* XCB ☑ MDCB* PCS ☑ RCB Re-entry HRGB ☐ ☐

** Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools		Special Tools				LWD	
Neutron-Porosity	☑	Borehole Televiewer	☐	Formation Fluid Sampling	☑	Density-Neutron	☑
Litho-Density	☑	Nuclear Magnetic Resonance	☑	Borehole Temperature & Pressure	☑	Resistivity-Gamma Ray	☑
Gamma Ray	☑	Geochemical	☐	Borehole Seismic	☑	Acoustic	☑
Resistivity	☑	Side-Wall Core Sampling	☐				
Acoustic	☑						
Formation Image	☑			Others ( )		Others (FMI)	☑

Max.Borehole Temp. : *Expected value (For Riser Drilling)* 150-170 degC

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from 1500 m to 3600 m, 5 m intervals

from 4300 m to 6200 m, 5 m intervals

Basic Sampling Intervals: 5m

Estimated days: Drilling/Coring: ??? | Logging: ?? | Total On-Site: ???

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Long-term observatory installation and data telemetry/recording

Hazards/ Weather:

Please check following List of Potential Hazards

						What is your Weather window? (Preferable period with the reasons)
Shallow Gas	☐	Complicated Seabed Condition	☐	Hydrothermal Activity	☐	May – August optimal (typhoon risk in late August to September)
Hydrocarbon	☐	Soft Seabed	☐	Landslide and Turbidity Current	☐	
Shallow Water Flow	☐	Currents	☑	Methane Hydrate	☑	
Abnormal Pressure	☐	Fractured Zone	☐	Diapir and Mud Volcano	☐	
Man-made Objects	☑	Fault	☑	High Temperature	☐	
H_2S	☐	High Dip Angle	☐	Ice Conditions	☐	
CO_2	☐					

Form 2 - Site Survey Detail

iSAS/IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☑ *Revised* ☐

Proposal #:	Site #: NT3-02A	Date Form Submitted: Apr. 1, 2003

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		YES	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line-B (Feb. 2003) Crossing Lines(s): JAMSTEC Line-9 (Feb. 2003)
2	Deep Penetration seismic reflection		YES	Primary Line(s): Location of Site on line (SP or Time only) KR0108-5, 3 Crossing Lines(s):
3	Seismic Velocity†		YES	Stacking velocity and PODM migration velocity from MCS lines. OBS wide-angle data also available.
4	Seismic Grid		YES	Acquired by JAMSTEC in Feb. 2003, also IFREE lines from 1998 - 2003
5a	Refraction (surface)		YES	Two-ship COP (max. offset 20km) was obtained by JAMSTEC in Sep. 2002
5b	Refraction (near bottom)		YES	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		NO	Location of Site on line (Time)
7	Swath bathymetry		YES	Multi-narrow beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		YES	Some data collected using IZANAGI side scan sonar
8b	Side-looking sonar (bottom)		NO	
9	Photography or Video		YES	Taken by submersibles of JASMTEC
10	Heat Flow		YES	Obtained from surface ship, submersibles, long-term monitoring and BSR
11a	Magnetics		YES	Compiled map published from AIST, Japan
11b	Gravity		YES	Compiled map published from AIST, Japan
12	Sediment cores		YES	Gravity and piston cores
13	Rock sampling		YES	Taken by submersible and ROV
14a	Water current data		YES	Available on JODC web page (http://www.jodc.go.jp/)
14b	Ice Conditions			
15	OBS microseismicity		YES	Obana et al., in press
16	Navigation		YES	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ✓ *Revised* ☐

Proposal #:	Site #: NT3-01A	Date Form Submitted: Apr. 1, 2003
Water Depth (m): 1950	Sed. Penetration (m): 6000	Basement Penetration (m): 200

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ✓
Are high temperatures expected at this site? Yes ✓ No
Are there any other special requirements for logging at this site? Yes ☐ No ✓
If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be:_____

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content,bulk density,and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electro-magnetic properties in sedimentary sequences and basement.	1
Acoustic	Yes, dipole sonic, LWD sonic for physical properties	
FMS	Preferably FMI & RAB. Imaging of sedimentary structures and fractures.Core-log correlation of structural features.	1
BHTV	Perhaps?	
Resistivity-Laterolog	LWD resistivity	
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents,bulk density,and lithology in unstable borehole environments.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	RAB, VSP Hydrofracturing, Packer injection test Geodetic/Seismic and multi-level packer borehole observatory	1

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:
borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

iSAS/IODP Site Summary Forms:

Form 4 – Pollution & Safety Hazard Summary

Please fill out information in all gray boxes

New ✓ *Revised* ☐

Proposal #:	Site #: NT3-01A	Date Form Submitted: Apr. 1, 2003

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal,then XCB to refusal.RCB to 6200 m or 200 m into basement.
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	JNOC will conduct BSR drilling in eastern Nankai in 2004. This data will be used for our program.
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSRs
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	Except for normal gas hydrate occurrence, none.
6	What "special" precautions will be taken during drilling?	Fault zones are likely unstable and overpressured, prone to collapse, possible pressure kicks.
7	What abandonment procedures do you plan to follow:	Unknown at this time for riser operations
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June – October)
9	Summary: What do you consider the major risks in drilling at this site?	Current, shallow overpressure (but latter is probably not major

iSAS/IODP Site Summary Forms:

Form 5 – Lithologic Summary

Proposal #:	Site #: NT3-01A	Date Form Submitted: Apr. 1, 2003

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
200 1000 4500 6000	Unconformity Unconformity Fault fault	Holocene to Miocene	1.6-2.5km/s	Slope sediments to old accretionary rocks	Accretionary prism		

Received 1 April 2005

IODP Proposal Cover Sheet

603D-Full2

☐ **New** ☒ **Revised** ☐ **Addendum**

Please fill out information in all gray boxes

Above For Official Use Only

Title:	The Nankai Trough Seismogenic Zone Experiment: Observatory Science at the Reference Sites		
Proponent(s):	Elizabeth Screaton, Michael Underwood, Demian Saffer, Kelin Wang, Geoff Wheat, Koichiro Obana, Greg Moore, Kevin Brown, Juichiro Ashi		
Keywords: *(5 or less)*	Subduction inputs; hydrogeology; long-term observatories	Area:	Nankai Trough Shikoku Basin

Contact Information:

Contact Person:	Elizabeth Screaton		
Department:	Department of Geology		
Organization:	University of Florida		
Address	PO Box 112120, 241 Williamson, Gainesville FL 32611 USA		
Tel.:	(352) 392-4612	Fax:	(352) 392-9294
E-mail:	screaton@ ufl.edu		

Permission to post abstract on IODP-MI Sapporo Web site: ☒ Yes ☐ No

Abstract: (*400 words or less)*

The NanTroSEIZE Complex Drilling Plan describes a multi-phase strategy to get at the root cause of the transition from stable sliding to stick-slip fault behavior -- by intersecting the "seismogenic conveyor belt" of Nankai Trough on either side of its up-dip limit of seismicity. With a campaign of coring, logging, downhole measurements, and long-term observatory science, NanTroSEIZE will test hypotheses concerning the onset of seismogenic behavior and locking of subduction thrusts. Characterizing the inputs to the seismogenic zone through examination of reference sites is a vital component of NanTroSEIZE. This revised full proposal outlines scientific rationale and plans for installation of long-term borehole observatories at NantroSEIZE reference sites. Monitoring at these observatories serves two distinct purposes. First, the observatories will provide information on material properties and background geophysical and geochemical conditions. The state of stress and strength of coupling on the plate-boundary fault are acutely sensitive to 3-D variations in pore pressure, and these pore pressures will be greatly affected by the distribution and permeability of turbidites and the permeability of the ocean crust. Second, observatories allow us to detect temporal changes in the geophysical or geochemical conditions and even the material properties. Temporal changes include the gradual stress build-up during the interseismic period. Associated variations in the thermal and hydrological regimes, and episodic seismic and aseismic strain events, could show how the seismogenic zone adjusts to new conditions caused by the stress build-up, which elevates predictive understanding of the seismogenic zone. Two reference sites in Shikoku Basin, on a basement high and basement plain, will show how stratigraphy, basement topography, and thermal structure affect the physical and hydrologic properties of subduction inputs. Each will require a pair of screened intervals: one targeting open basement and one targeting the overlying sediment. A site located 7 km seaward of the deformation front will indicate how far pressure and chemistry anomalies are transmitted seaward of the deformation front. CORK monitoring at the toe of the accretionary prism will isolate temperature and pressure signals in the frontal décollement from signals in the subducting turbidites. A second shallow observatory at the prism toe will monitor micro-seismicity and strain. An observatory in Kumano Basin provides an important complement to background and transient data obtained within and seaward of the mega-splay system. This monitoring network will provide a vital context for observations within the plate boundary fault system.

603D-Full2

Scientific Objectives: (*250 words or less*)

Coring, logging, and conventional downhole measurements will commence at four reference sites during Phase I and II of the Nankai Trough Seismogenic Zone Experiment. This proposal describes scientific objectives for long-term borehole observatories to be installed at four of these sites and one additional site. The fundamental objectives of the proposed observatory science are to map background properties of the incoming sediment and crust and to monitor temporal changes associated with the seismic cycle. Specific objectives include:
(1) Monitor the differences in hydrologic properties and fluid-flow signals where basement highs are subducting versus where basement plains are subducting.
(2) Determine if, where, and why compartments of excess pore pressure develop seaward of the deformation front; if present, determine their effect on early-subduction fault dynamics.
(3) Compare hydrologic properties and fluid-flow signals in turbidite sand bodies before and after they have passed beneath the toe of the accretionary prism Assess the role of these turbidite sand bodies in drainage of deeper sediments, and impacts of drainage on plate boundary strength.
(4) Monitor hydrologic properties and fluid-flow signals within the frontal décollement zone for rigorous comparison against properties and flow in subducted sand lenses beneath the décollement.
(5) Determine how basement fluid flow influences margin-scale patterns of heat flow and fluid flow.
(6) Monitor micro-seismicity, strain, and fluid flow response to tectonic events.

Please describe below any non-standard measurements technology needed to achieve the proposed scientific objectives.

Proposed Sites:

Site Name	Position	Water Depth (m)	Penetration (m)			Brief Site-specific Objectives
			Sed	Bsm	Total	
NT1-01A	Lat: 32° 44.8878'N Long: 136° 55.0236'E	3540	460m	40m	500m	One CORK hole with screened interval in position equivalent to turbidites and sealed basement. Companion CORK hole with fully cased sediment & open basement.
NT1-02A	Lat: 32° 47.4996'N Long: 137° 09.2784' E	4210	730m	40m	770m	One CORK hole with screened interval in turbidites and sealed basement. Companion CORK hole with fully cased sediment and open basement.
NT1-03A	Lat: 33° 01.23258'N Long: 136° 47.9485'E	4125	1200m	0m	1200m	CORK monitoring of décollement and turbidites; will not extend to basement. Monitor micro-seismicity and strain.
NT1-05A	Lat: 33° 01.3482'N Long: 137° 3.3432'E	4310	1528m	40m	1568m	One CORK hole with screened intervals in turbidites and sealed basement. Companion CORK hole with fully cased sediment and open basement.
NT1-06A	Lat: 32° 51.35'N Long: 137° 17.58'E	4200	990m	40m	1030m	Alternate to NT1-02A. One CORK hole with screened interval in turbidites and sealed basement. Companion CORK hole with fully cased sediment and open basement.
NT2-04A	Lat: 33° 23.4'N, Long: 136° 34.6'E	1990	1400m forearc basin	40m acoustic basement	1440m	One CORK hole with screened intervals in sediments. Monitor micro-seismicity and strain.

IODP Site Summary Forms:

Form 1 - General Site Information

603D-Full2

Please fill out information in all gray boxes
Revised 7 March 2002

New ■ **Revised** □

Section A: Proposal Information

Title of Proposal:	The Nankai Trough Seismogenic Zone Experiment: Observatory Science at the Reference Sites
Date Form Submitted:	Sept. 30, 2004
Site Specific Objectives with Priority (Must include general objectives in proposal)	One CORK hole with screened interval in turbidites and sealed basement. Companion CORK hole with fully cased sediment and open basement. Reference site to characterize hydrology of Shikoku Basin strata and upper igneous crust where a bathymetric mound is underlain by a basement high. Objectives are to show how stratigraphy, basement topography, and thermal structure affect the physical and hydrologic properties of subduction inputs.
List Previous Drilling in Area:	This site would be a return to NT1-01A, which is proposed to be drilled in 603A-Full2 (NantroSEIZE Reference Sites).

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT1-01A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Nankai Trough off Kii
Latitude:	Deg: 32 N	Min: :44.8878	Jurisdiction:	Japan
Longitude:	Deg: 136 E	Min: 55.0236	Distance to Land:	130 km to Cape Shiono-Misaki
Coordinates System:	WGS 84, Other ( )			
Priority of Site:	Primary:x	Alt:	Water Depth:	3540 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	460 What is the total sed. thickness? 460 m	40
	Total Penetration: 500 m	
General Lithologies:	Possible silt/mud turbidites and ash layers Hemipelagic mud and mudstone	Basalt
Coring Plan: *(Specify or check)*	Limited coring as necessary to confirm screen locations for CORKs	
	1-2-3-APC ☐ VPC* ☐ CB ☐ DCB* ☐ CS ☐ RCB ☐ Re-entry ☐ HLAPC ☐	
	** Systems Currently Under Development*	

Wireline Logging Plan:

Standard Tools	Special Tools		LWD
Neutron-Porosity ☐	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ☐
Litho-Density ☐	Nuclear Magnetic Resonance ☐	Borehole Temperature & Pressure ☐	Resistivity-Gamma Ray ☐
Gamma Ray ☐	Geochemical ☐	Borehole Seismic ☐	Acoustic ☐
Resistivity ☐ ☐	Side-Wall Core Sampling ☐	Limited measurements if needed to fill gaps from previous (Phase I) drilling.	
Acoustic ☐			
Formation Image		Others ( )	Others ( )

Max.Borehole Temp. :
Expected value (For Riser Drilling)
_____°C

Mud Logging: *(Riser Holes Only)*
Cuttings Sampling Intervals
from _____ m to _____ m, _____ m intervals
from _____ m to _____ m, _____ m intervals
Basic Sampling Intervals: 5m

Estimated days:

Drilling/Coring: 5	Logging: 12 (install casing/CORKs)	Total On-Site: 17

Future Plan:
Longterm Borehole Observation Plan/Re-entry Plan
Long term monitoring (CORKs) of basement and overlying sediments.

Hazards/ Weather:
Please check following List of Potential Hazards

Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐
Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐
Shallow Water Flow ☐	Currents ■	Methane Hydrate ☐
Abnormal Pressure ☐	Fractured Zone ☐	Diapir and Mud Volcano ☐
Man-made Objects ☐	Fault ☐	High Temperature ☐
H_2S ☐	High Dip Angle ☐	Ice Conditions ☐
CO_2 ☐		

What is your Weather window? (Preferable period with the reasons)
April-July: Avoid typhoon season

Form 2 - Site Survey Detail

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ☐ *Revised* ☐

'roposal #: 603D-Full	Site #: NT1-01A	Date Form Submitted: Sept. 30, 2004

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		No	Primary Line(s) :Location of Site on line (SP or Time only) Crossing Lines(s):
2	Deep Penetration seismic reflection		Yes	Primary Line(s): KR9806-2 SP2710 Location of Site on line (SP or Time only) Crossing Lines(s): KR0211-S0
3	Seismic Velocity†		Yes	Stacking velocity and migration velocity from MCS lines. OBS data.
4	Seismic Grid		Yes	
5a	Refraction (surface)		Yes	Two ship COP (maximum offset 20 km) obtained by JAMSTEC.
5b	Refraction (near bottom)		Yes	OBS data by Nakanishi et al. (1997)
6	3.5 kHz			Location of Site on line (Time)
7	Swath bathymetry		Yes	Multi-narrow-beam data by JAMSTEC R/V Yokusuka.
8a	Side-looking sonar (surface)		No	
8b	Side-looking sonar (bottom)		No	
9	Photography or Video		No	
10	Heat Flow		Yes.	
11a	Magnetics		Yes	Compiled map published from AIST, Japan.
11b	Gravity		Yes	Compiled map published from AIST, Japan.
12	Sediment cores		No	
13	Rock sampling		No	
14a	Water current data			Available on JODC web page (http://www.jodc.go.jp)
14b	Ice Conditions			
15	OBS microseismicity		Yes	
16	Navigation		Yes	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

IODP Site Summary Forms:

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT1-01A	Date Form Submitted: Sept. 30, 2004
Water Depth (m): 3540	Sed. Penetration (m): 460	Basement Penetration (m): 40

Do you need to use the conical side-entry sub (CSES) at this site? Yes □ No ■

Are high temperatures expected at this site? Yes □ No ■

Are there any other special requirements for logging at this site? Yes □ No ■

If "Yes" Please describe requirements: No logging planned. Site will have been logged in previous phase. CORK installation only

What do you estimate the total logging time for this site to be: 12 days install casing/CORKS

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity		
Litho-Density		
Natural Gamma Ray		
Resistivity-Induction		
Acoustic		
FMS		
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)		
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	CORK	

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT1-01A	Date Form Submitted: Sept. 30, 2004

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	RCB with limited coring to confirm monitoring intervals for CORK. CORK installation
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	None
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	No
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	No
6	What "special" precautions will be taken during drilling?	None
7	What abandonment procedures do you plan to follow:	None. Holes will be CORKed.
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current. Typhoon season (June to Oct)
9	Summary: What do you consider the major risks in drilling at this site?	Current

IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ■ *Revised* □

New

Proposal #: 603D-Full	Site #: NT1-01A	Date Form Submitted: Sept. 30, 2004

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
seafloor			1.6-1.9	Hemipelagite	Backarc basin Floor	23 m/my	
460	Unconformity	20 Ma	2.0	Volcanic sediment and basement basalt	Backarc basin spreading ridge		
560	Total depth						

603D-Full2

IODP Site Summary Forms:

Form 1 - General Site Information

Please fill out information in all gray boxes
Revised 7 March 2002

New ■ **Revised** □

Section A: Proposal Information

Title of Proposal:	The Nankai Trough Seismogenic Zone Experiment: Observatory Science at the Reference Sites
Date Form Submitted:	Sept. 30, 2004
Site Specific Objectives with Priority (Must include general objectives in proposal)	One CORK hole with screened interval in turbidites and sealed basement. Companion CORK hole with fully cased sediment and open basement. Reference site to characterize hydrology of Shikoku Basin strata and upper igneous crust where basement topography is relatively flat. Objectives are to document how stratigraphy, basement topography, and thermal structure affect the physical and hydrologic properties of subduction inputs.
List Previous Drilling in Area:	This site would be a return to NT1-02A, which is proposed to be drilled in 603A-Full2 (NantroSEIZE Reference Sites).

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT1-02A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Nankai Trough off Kii
Latitude:	Deg: 32 N	Min: :47.4996	Jurisdiction:	Japan
Longitude:	Deg: 137 E	Min: 9.2784	Distance to Land:	145 km to Cape Shiono-Misaki
Coordinates System:	WGS 84,	Other ( )		
Priority of Site:	Primary:x	Alt:	Water Depth:	4210 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	730 What is the total sed. thickness? 730 m	40
	Total Penetration: 770 m	
General Lithologies:	Possible silt/mud turbidites and ash layers Hemipelagic mud and mudstone	Basalt
Coring Plan: *(Specify or check)*	Limited coring as necessary to confirm screen locations for CORKs	
	1-2-3-APC ☐ VPC* ☐ CB ☐ DCB* ☐ CS ☐ RCB ☐ Re-entry ☐ HLAPC ☐ ** Systems Currently Under Development*	

Wireline Logging Plan:

Standard Tools	Special Tools		LWD
Neutron-Porosity ☐	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ☐
Litho-Density ☐	Nuclear Magnetic Resonance ☐	Borehole Temperature & Pressure ■	Resistivity-Gamma Ray ☐
Gamma Ray ☐	Geochemical ☐	Borehole Seismic ☐	Acoustic ☐
Resistivity ☐ ☐	Side-Wall Core Sampling ☐	Limited measurements if needed to fill gaps from previous (Phase I) drilling.	
Acoustic ☐			
Formation Image		Others ( )	Others ( )

Max.Borehole Temp. :	*Expected value (For Riser Drilling)* _____°C
Mud Logging: *(Riser Holes Only)*	Cuttings Sampling Intervals from _____ m to _____ m, _____ m intervals from _____ m to _____ m, _____ m intervals *Basic Sampling Intervals: 5m*
Estimated days:	Drilling/Coring: 6 days; Logging: 12 (install casing/CORKs); Total On-Site: 18 days
Future Plan:	*Longterm Borehole Observation Plan/Re-entry Plan* Long term monitoring (CORKs) of basement and overlying sediments.

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐
Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐
Shallow Water Flow ☐	Currents ■	Methane Hydrate ☐
Abnormal Pressure ☐	Fractured Zone ☐	Diapir and Mud Volcano ☐
Man-made Objects ☐	Fault ☐	High Temperature ☐
H_2S ☐	High Dip Angle ☐	Ice Conditions ☐
CO_2 ☐		

What is your Weather window? (Preferable period with the reasons)

April-July: Avoid typhoon season

Form 2 - Site Survey Detail

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* □

'roposal #: 603D-Full	Site #: NT1-02A	Date Form Submitted: Sept. 30, 2004

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		No	Primary Line(s) :Location of Site on line (SP or Time only) Crossing Lines(s):
2	Deep Penetration seismic reflection		Yes	Primary Line(s): KR9806-1 SP1740 Location of Site on line (SP or Time only) Crossing Lines(s): KR0211-S0 nearby
3	Seismic Velocity†		Yes	Stacking velocity and migration velocity from MCS lines. OBS data.
4	Seismic Grid		Yes	
5a	Refraction (surface)		Yes	Two ship COP (maximum offset 20 km) obtained by JAMSTEC.
5b	Refraction (near bottom)		Yes	OBS data by Nakanishi et al. (1997)
6	3.5 kHz			Location of Site on line (Time)
7	Swath bathymetry		Yes	Multi-narrow-beam data by JAMSTEC R/V Yokusuka.
8a	Side-looking sonar (surface)		No	
8b	Side-looking sonar (bottom)		No	
9	Photography or Video		No	
10	Heat Flow		Yes.	
11a	Magnetics		Yes	Compiled map published from AIST, Japan.
11b	Gravity		Yes	Compiled map published from AIST, Japan.
12	Sediment cores		No	
13	Rock sampling		No	
14a	Water current data			Available on JODC web page (http://www.jodc.go.jp)
14b	Ice Conditions			
15	OBS microseismicity		Yes	
16	Navigation		Yes	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

IODP Site Summary Forms:

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT1-02A	Date Form Submitted: Sept. 30, 2004
Water Depth (m): 4210	Sed. Penetration (m): 730	Basement Penetration (m): 40

Do you need to use the conical side-entry sub (CSES) at this site? Yes □ No ■

Are high temperatures expected at this site? Yes □ No ■

Are there any other special requirements for logging at this site? Yes □ No ■

If "Yes" Please describe requirements: No logging planned. Site will have been logged in previous phase. CORK installation only

What do you estimate the total logging time for this site to be: 12 days (CORK/casing install)

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity		
Litho-Density		
Natural Gamma Ray		
Resistivity-Induction		
Acoustic		
FMS		
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)		
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	CORK	

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT1-02A	Date Form Submitted: Sept. 30, 2004

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	RCB with limited coring to confirm monitoring intervals for CORK. CORK installation
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	None
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	No
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	No
6	What "special" precautions will be taken during drilling?	May need casing of sandy turbidites prior to basement drilling/basement CORK installation.
7	What abandonment procedures do you plan to follow:	None. Holes will be CORKed.
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current. Typhoon season (June to Oct)
9	Summary: What do you consider the major risks in drilling at this site?	Current

IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ■ *Revised* □

New

Proposal #: 603D-Full	Site #: NT1-02A	Date Form Submitted: Sept. 30, 2004

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
seafloor 730 830	 Unconformity Total depth	 20 Ma	1.6-1.9 2.0	Hemipelagite and turbidites Volcanic sediment and basement basalt	Backarc basin Floor Backarc basin spreading ridge	36 m/my	Heterogeneous stratigraphy with irregular packets of turbidite sand.

603D-Full2

IODP Site Summary Forms:

Form 1 - General Site Information

Please fill out information in all gray boxes
Revised 7 March 2002

New ■ **Revised** □

Section A: Proposal Information

Title of Proposal:	The Nankai Trough Seismogenic Zone Experiment: Observatory Science at the Reference Sites
Date Form Submitted:	Sept. 30, 2004
Site Specific Objectives with Priority (Must include general objectives in proposal)	Reference site to characterize hydrology of decollement and underlying turbidites at the toe of the accretionary prism and to monitor micro-seismicity and strain. Objectives are to install CORK to monitor hydrologic properties and fluid-flow signals within and below the frontal décollement zone.
List Previous Drilling in Area:	This site would be a return to NT1-03A, which is proposed to be drilled in 603A-Full2 (NantroSEIZE Reference Sites).

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT1-03A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Nankai Trough off Kii
Latitude:	Deg: 33 N	Min: 1.23258	Jurisdiction:	Japan
Longitude:	Deg: 136 E	Min: 47.94852	Distance to Land:	100 km to Cape Shiono-Misaki
Coordinates System:	WGS 84, Other ( )			
Priority of Site:	Primary:x	Alt:	Water Depth:	4125 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	1200 What is the total sed. thickness? 1740 m	
	Total Penetration: 1200 m	
General Lithologies:	Silt and sand turbidites, ash layers, hemipelagic mud and mudstone	
Coring Plan: *(Specify or check)*	Limited coring as necessary to confirm screen locations for CORKs	
	1-2-3-APC ☐ VPC* ☐ CB ☐ DCB* ☐ CS ■ Re-entry HLAPC ☐	
	** Systems Currently Under Development*	

Wireline Logging Plan:

Standard Tools	Special Tools		LWD
Neutron-Porosity ☐	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ☐
Litho-Density ☐	Nuclear Magnetic Resonance ☐	Borehole Temperature & Pressure ■	Resistivity-Gamma Ray ☐
Gamma Ray ☐	Geochemical ☐	Borehole Seismic ☐	Acoustic ☐
Resistivity ☐ ☐	Side-Wall Core Sampling ☐	Limited measurements if needed to fill gaps from previous (Phase I) drilling.	
Acoustic ☐			
Formation Image		Others ( )	Others ( )

Max.Borehole Temp. :	*Expected value (For Riser Drilling)* _____°C
Mud Logging: *(Riser Holes Only)*	Cuttings Sampling Intervals from _____ m to _____ m, _____ m intervals from _____ m to _____ m, _____ m intervals *Basic Sampling Intervals: 5m*
Estimated days:	Drilling/Coring: 6 days; Logging:12 (install casing/CORKs); Total On-Site: 18 days
Future Plan:	*Longterm Borehole Observation Plan/Re-entry Plan* Long term monitoring (CORKs) of turbidites and decollement.

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐
Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐
Shallow Water Flow ☐	Currents ■	Methane Hydrate ☐
Abnormal Pressure ☐	Fractured Zone ■	Diapir and Mud Volcano ☐
Man-made Objects ☐	Fault ■	High Temperature ☐
H_2S ☐	High Dip Angle ☐	Ice Conditions ☐
CO_2 ☐		

What is your Weather window? (Preferable period with the reasons)

April-July: Avoid typhoon season

Form 2 - Site Survey Detail

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* □

'roposal #: 603D-Full	Site #: NT1-03A	Date Form Submitted: Sept. 30, 2004

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		No	Primary Line(s) :Location of Site on line (SP or Time only) Crossing Lines(s):
2	Deep Penetration seismic reflection		Yes	Primary Line(s): KR0108-4 SP16550 Location of Site on line (SP or Time only) Crossing Lines(s):
3	Seismic Velocity†		Yes	Stacking velocity and migration velocity from MCS lines. OBS data.
4	Seismic Grid		Yes	
5a	Refraction (surface)		Yes	Two ship COP (maximum offset 20 km) obtained by JAMSTEC.
5b	Refraction (near bottom)		Yes	OBS data by Nakanishi et al. (1997)
6	3.5 kHz			Location of Site on line (Time)
7	Swath bathymetry		Yes	Multi-narrow-beam data by JAMSTEC R/V Yokusuka.
8a	Side-looking sonar (surface)		No	
8b	Side-looking sonar (bottom)		No	
9	Photography or Video		No	
10	Heat Flow		Yes.	
11a	Magnetics		Yes	Compiled map published from AIST, Japan.
11b	Gravity		Yes	Compiled map published from AIST, Japan.
12	Sediment cores		No	
13	Rock sampling		No	
14a	Water current data			Available on JODC web page (http://www.jodc.go.jp)
14b	Ice Conditions			
15	OBS microseismicity		Yes	
16	Navigation		Yes	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

IODP Site Summary Forms:

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT1-03A	Date Form Submitted: Sept. 30, 2004
Water Depth (m): 4125	Sed. Penetration (m): 1200	Basement Penetration (m): 0

Do you need to use the conical side-entry sub (CSES) at this site? Yes □ No ■

Are high temperatures expected at this site? Yes □ No ■

Are there any other special requirements for logging at this site? Yes □ No ■

If "Yes" Please describe requirements: No logging planned. Site will have been logged in previous phase. CORK installation only

What do you estimate the total logging time for this site to be: 12 days (CORK/casing install)

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity		
Litho-Density		
Natural Gamma Ray		
Resistivity-Induction		
Acoustic		
FMS		
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)		
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	CORK	

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT1-03A	Date Form Submitted: Sept. 30, 2004

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	RCB with limited coring to confirm monitoring intervals for CORK. CORK installation
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	None
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	No
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	No
6	What "special" precautions will be taken during drilling?	May need shallow casing to to stabilize sandy turbidites.
7	What abandonment procedures do you plan to follow:	None. Holes will be CORKed.
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current. Typhoon season (June to Oct)
9	Summary: What do you consider the major risks in drilling at this site?	Current, instability of accreted trench turbidites.

IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ■ *Revised* □

New

Proposal #: 603D-Full	Site #: NT1-03A	Date Form Submitted: Sept. 30, 2004

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
seafloor			1.5	Hemipelagite + volcanic ash	Upper Shikoku Basin		
230	Fault	Quaternary	1.6-1.8	turbidites	Trench wedge		Probably contains thick layers of unconsolidated sands.
790	Reflector	Pleistocene	1.9	hemipelagite and volcanic ash	Upper Shikoku Basin		
1000	Reflector	Plio-Miocene	2.4	hemipelagite + turbidite	Lowe Shikoku Basin		Heterogeneous stratigraphy with irregular packets of sand or sandstone
1200	Total depth						

603D-Full2

IODP Site Summary Forms:

Form 1 - General Site Information

Please fill out information in all gray boxes
Revised 7 March 2002

New ■ **Revised** □

Section A: Proposal Information

Title of Proposal:	The Nankai Trough Seismogenic Zone Experiment: Observatory Science at the Reference Sites
Date Form Submitted:	Sept. 30, 2004
Site Specific Objectives with Priority (Must include general objectives in proposal)	One CORK hole with screened interval in turbidites and sealed basement. Companion CORK hole with fully cased sediment and open basement. Objectives are to document variations in turbidite and basement fluid flow between NT1-02A and deformation front.
List Previous Drilling in Area:	No scientific drilling in immediate vicinity. DSDP 87, ODP 131, 190, and 196 were conducted about 200 km SW of this proposal's sites.

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT1-05A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Nankai Trough off Kii
Latitude:	Deg: 33 N	Min: 01.3482	Jurisdiction:	Japan
Longitude:	Deg: 137 E	Min: 3.3432	Distance to Land:	120 km to Cape Shiono-Misaki
Coordinates System:	WGS 84,	Other ( )		
Priority of Site:	Primary:	Alt:x	Water Depth:	4310 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	1528 What is the total sed. thickness? 1528 m	40
	Total Penetration: 1568 m	
General Lithologies:	Possible silt/mud turbidites and ash layers Hemipelagic mud and mudstone	Basalt
Coring Plan: *(Specify or check)*	APC/XCB to refusal, RCB to TD.	
	1-2-3-APC ■ VPC* ☐ CB ■ DCB* ☐ CS RCB Re☐try H☐B ☐ ** Systems Currently Under Development*	

Wireline Logging Plan:

Standard Tools	Special Tools		LWD
Neutron-Porosity ■	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ■
Litho-Density ■	Nuclear Magnetic Resonance ☐	Borehole Temperature & Pressure ■	Resistivity-Gamma Ray ■
Gamma Ray ■	Geochemical ☐	Borehole Seismic ☐	Acoustic ■
Resistivity ■	Side-Wall Core Sampling ☐		
Acoustic ■			
Formation Image ■		Others ( )	Others ( )

Max.Borehole Temp. : *Expected value (For Riser Drilling)* _____°C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from _____ m to _____ m, _____ m intervals

from _____ m to _____ m, _____ m intervals

Basic Sampling Intervals: 5m

Estimated days:			
	Drilling/Coring: 18 days	Logging: 7 logging, 12 CORK/casing	Total On-Site: 37 days

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Long term monitoring (CORKs) of basement and overlying sediments.

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐
Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐
Shallow Water Flow ☐	Currents ■	Methane Hydrate ☐
Abnormal Pressure ☐	Fractured Zone ☐	Diapir and Mud Volcano ☐
Man-made Objects ☐	Fault ☐	High Temperature ☐
H_2S ☐	High Dip Angle ☐	Ice Conditions ☐
CO_2 ☐		

What is your Weather window? (Preferable period with the reasons)

April-July: Avoid typhoon season

Form 2 - Site Survey Detail

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* □

'roposal #: 603D-Full	Site #: NT1-05A	Date Form Submitted: Sept. 30, 2004

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		No	Primary Line(s) :Location of Site on line (SP or Time only) Crossing Lines(s):
2	Deep Penetration seismic reflection		Yes	Primary Line(s): KR9806-1 SP2922 Location of Site on line (SP or Time only) Crossing Lines(s): KY0314-100 SP 3558
3	Seismic Velocity†		Yes	Stacking velocity and migration velocity from MCS lines. OBS data.
4	Seismic Grid		Yes	
5a	Refraction (surface)		Yes	Two ship COP (maximum offset 20 km) obtained by JAMSTEC.
5b	Refraction (near bottom)		Yes	OBS data by Nakanishi et al. (1997)
6	3.5 kHz			Location of Site on line (Time)
7	Swath bathymetry		Yes	Multi-narrow-beam data by JAMSTEC R/V Yokusuka.
8a	Side-looking sonar (surface)		No	
8b	Side-looking sonar (bottom)		No	
9	Photography or Video		No	
10	Heat Flow		Yes.	
11a	Magnetics		Yes	Compiled map published from AIST, Japan.
11b	Gravity		Yes	Compiled map published from AIST, Japan.
12	Sediment cores		No	
13	Rock sampling		No	
14a	Water current data			Available on JODC web page (http://www.jodc.go.jp)
14b	Ice Conditions			
15	OBS microseismicity		Yes	
16	Navigation		Yes	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

IODP Site Summary Forms:

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT1-05A	Date Form Submitted: Sept. 30, 2004
Water Depth (m): 4310	Sed. Penetration (m): 1528	Basement Penetration (m): 40

Do you need to use the conical side-entry sub (CSES) at this site? Yes □ No ■

Are high temperatures expected at this site? Yes □ No ■

Are there any other special requirements for logging at this site? Yes □ No ■

If "Yes" Please describe requirements:_____

What do you estimate the total logging time for this site to be: 7 days logging, 12 days CORK/casing install

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity	Estimation of water content in sedimentary sequences and basement.	1
Litho-Density	Estimation of water content, bulk density, and mineral composition in sedimentary sequences and basement.	1
Natural Gamma Ray	Estimation of clay contents and mineral composition in sedimentary sequences and basement.	1
Resistivity-Induction	Estimation of water content and electromagnetic properties in sedimentary sequence and basement.	1
Acoustic	Determination of in situ velocity and estimation of physical properties. Comparsion with seismic velocity and create synthetic seismograms.	1
FMS	Imaging of sedimentary structures and fractures. Core-log correlation of structural features.	2
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)	Estimation of water contents, bulk density and lithology in unstable borehole environments.	1
Resitivity-Gamma Ray (LWD)	Estimation of water contents, electro-magnetic properties, and lithology in unstable borehole environment.	1
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	Packer: hydrologic tests of sediment + basement VSP: core-log-seismic integration CORK: monitoring of sediment P, T, chem	1

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* ▭

Proposal #: 603D-Full	Site #: NT1-05A	Date Form Submitted: Sept. 30, 2004

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	APC to refusal, XCB to refusal. RCB to TD, log. CORK installation.
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	None
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	No
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	No
6	What "special" precautions will be taken during drilling?	May need casing of sandy turbidites prior to basement drilling/basement CORK installation.
7	What abandonment procedures do you plan to follow:	None. Holes will be CORKed.
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current. Typhoon season (June to Oct)
9	Summary: What do you consider the major risks in drilling at this site?	Current

IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ■ *Revised* ▭

New

Proposal #: 603D-Full	Site #: NT1-05A	Date Form Submitted: Sept. 30, 2004

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
seafloor			1.55-2.37	Hemipelagite and turbidites	Backarc basin Floor		Heterogeneous stratigraphy with irregular packets of turbidite sand.
1528	Unconformity	~20 Ma		Volcanic sediment and basement basalt	Backarc basin spreading ridge		
1568	Total depth						

iSAS/IODP Site Summary Forms:
Form 1 - General Site Information

Please fill out information in all gray boxes
Revised 7 March 2002

603D-Full2

New ■ **Revised** □

Section A: Proposal Information

Title of Proposal:	NanTroSEIZE Reference Sites: Sampling and Measuring Inputs to the Seismogenic Zone
Date Form Submitted:	3/31/05
Site Specific Objectives with Priority (Must include general objectives in proposal)	One CORK hole with screened interval in turbidites and sealed basement. Companion CORK hole with fully cased sediment and open basement. Reference site to characterize hydrology of Shikoku Basin strata and upper igneous crust where basement topography is relatively flat. Objectives are to document how stratigraphy, basement topography, and thermal structure affect the physical and hydrologic properties of subduction inputs.
List Previous Drilling in Area:	This site would be a return to NT1-06A, proposed as an alternate to NT1-02A from proposal 603A-Full2 (NantroSEIZE Reference Sites).

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT01-06A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Nankai Trough off Kii
Latitude:	Deg: 32 N	Min: 51.35	Jurisdiction:	Japan
Longitude:	Deg: 137 E	Min: 17.58	Distance to Land:	145 km to Cape Shiono-Misaki
Coordinates System:	WGS 84, Other ( )			
Priority of Site:	Primary:	Alt: X	Water Depth:	4200 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	990 m What is the total sed. thickness? 990 m	40 m
	Total Penetration: 1030 m	
General Lithologies:	Silt and sand turbidites, ash layers, hemipelagic mud and mudstone	Basalt
Coring Plan: *(Specify or check)*	Limited coring as necessary to confirm screen locations for CORKs 1-2-3-APC ☐ VPC* ☐ XCB ☐ MDCB* ☐ PCS ☐ RCB ☒ Re-entry ☐ HRGB ☐ ** Systems Currently Under Development*	

Wireline Logging Plan:	Standard Tools	Special Tools		LWD
	Neutron-Porosity ☐	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ☐
	Litho-Density ☐	Nuclear Magnetic Resonance ☐	Borehole Temperature & Pressure ☒	Resistivity-Gamma Ray ☐
	Gamma Ray ☐	Geochemical ☐	Borehole Seismic ☐	Acoustic ☐
	Resistivity ☐	Side-Wall Core Sampling ☐	Limited measurements if needed to fill gaps from previous (Phase I) drilling.	
	Acoustic ☐			
	Formation Image ☐		Others ( )	Others ( )

Max.Borehole Temp. :	**Expected value (For Riser Drilling)** ~~_____~~ °C	
Mud Logging: *(Riser Holes Only)*	Cuttings Sampling Intervals from ____ m to ____ m, ____ m intervals from ____ m to ____ m, ____ m intervals **Basic Sampling Intervals: 5m**	
Estimated days:	Drilling/Coring: 7 days	Logging: 12 days (casing/CORK) / Total On-Site: 19 days
Future Plan:	**Longterm Borehole Observation Plan/Re-entry Plan** CORK observatory	

Hazards/ Weather:	**Please check following List of Potential Hazards**			*What is your Weather window? (Preferable period with the reasons)*
	Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐	April-July : avoid typhoon season
	Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐	
	Shallow Water Flow ☐	Currents ☒	Methane Hydrate ☐	
	Abnormal Pressure ☐	Fractured Zone ☐	Diapir and Mud Volcano ☐	
	Man-made Objects ☐	Fault ☐	High Temperature ☐	
	H_2S ☐	High Dip Angle ☐	Ice Conditions ☐	
	CO_2 ☐			

iSAS/IODP Site Summary Forms:

Form 2 - Site Survey Detail

Please fill out information in all gray boxes

New ■ **Revised** □

'roposal #: 603A-Full	Site #: NT01-06A	Date Form Submitted: 11/05/04

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		Yes	Primary Line(s) :Location of Site on line (SP or Time only) odkm03-103-1 SP2860 Crossing Lines(s): odkm03-ACA SP2175
2	Deep Penetration seismic reflection		Yes	Primary Line(s): Location of Site on line (SP or Time only) KR9806-1 nearby Crossing Lines(s): KR0211-S0 nearby
3	Seismic Velocity†		Yes	Stacking velocity and migration velocity from MCS lines. OBS data
4	Seismic Grid		Yes	
5a	Refraction (surface)		Yes	Two ship COP (maximum offset 20 km) obtained by JAMSTEC at the end of September, 2002.
5b	Refraction (near bottom)		Yes	OBS data by Nakanishi et al. (1997)
6	3.5 kHz		No	Location of Site on line (Time)
7	Swath bathymetry		Yes	Multi-narrow-beam data by JAMSTEC R/V Yokosuka
8a	Side-looking sonar (surface)		No	
8b	Side-looking sonar (bottom)		No	
9	Photography or Video		No	
10	Heat Flow		Yes	
11a	Magnetics		Yes	Compiled map published from AIST, Japan
11b	Gravity		Yes	Compiled map published from AIST, Japan
12	Sediment cores		No	
13	Rock sampling		No	
14a	Water current data			Available on JODC web page (http://www.jodc.go.jp)
14b	Ice Conditions			
15	OBS microseismicity		Yes	
16	Navigation		Yes	
17	Other			

Form 3 - Detailed Logging Plan

iSAS/IODP Site Summary Forms:

New ■ **Revised** ☐

Proposal #: 603D-Full2	Site #: NT01-06A	Date Form Submitted: 3/31/05
Water Depth (m): 4200	Sed. Penetration (m): 990	Basement Penetration (m): 40

Do you need to use the conical side-entry sub (CSES) at this site? Yes ☐ No ☒
Are high temperatures expected at this site? Yes ☐ No ☒
Are there any other special requirements for logging at this site? Yes ☐ No ☒
If "Yes" Please describe requirements: No logging planned. Site will have been logged in previous phase.

What do you estimate the total logging time for this site to be: 12 days casing CORK install

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	CORK	

iSAS/IODP Site Summary Forms:

Form 4 – Pollution & Safety Hazard Summary

Please fill out information in all gray boxes

New ■ **Revised** ☐

Proposal #: 603D-Full2	Site #: NT01-06A	Date Form Submitted: 3/31/05

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	RCB with limited coring to confirm monitoring intervals for CORK. CORK installation
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	None
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	No
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	No
6	What "special" precautions will be taken during drilling?	Standard monitoring of C_1 to C_n; shallow casing may be needed to stabilize shallow sandy turbidite layers.
7	What abandonment procedures do you plan to follow:	None. Will be CORKed.
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current, typhoon (June to Oct.)
9	Summary: What do you consider the major risks in drilling at this site?	Kuroshio Current

Form 5 – Lithologic Summary

iSAS/IODP Site Summary Forms:

New ■ **Revised** ☐

Proposal #: 603D-Full2	Site #: NT01-06A	Date Form Submitted: 3/31/05

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
990	unconformity	Holocene to lower Miocene	1.6-1.9	Hemipelagite + volcanic ash + turbidites	backarc basin floor	36 m/My	Heterogeneous stratigraphy with irregular packets of turbidite sand
		20 Ma	2.0	volcanic sediment and basement basalt	backarc basin		

603D-Full2

IODP Site Summary Forms:

Form 1 - General Site Information

Please fill out information in all gray boxes
Revised 7 March 2002

New ■ **Revised** □

Section A: Proposal Information

Title of Proposal:	The Nankai Trough Seismogenic Zone Experiment: Observatory Science at the Reference Sites
Date Form Submitted:	Sept. 30, 2004
Site Specific Objectives with Priority (Must include general objectives in proposal)	CORK monitoring for material properties, strain, geochemistry seaward of deep riser hole (NT3-01). Monitoring intervals in clay-rich horizon (for strain) and in sandy horizon (for diffusive signal). Target depths will be refined based on prior drilling.
List Previous Drilling in Area:	This site would be a return to NT2-04A which is proposed to be drilled in 603B-Full2.

Section B: General Site Information

Site Name: (e.g. SWPAC-01A)	NT2-04A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Kumano Basin off Kii
Latitude:	Deg: 33 N	Min: 23.4	Jurisdiction:	Japan
Longitude:	Deg: 136 E	Min: 34.6'	Distance to Land:	60 km to Cape Shiono-Misaki
Coordinates System:	WGS 84, Other ( )			
Priority of Site:	Primary:x	Alt:	Water Depth:	1990 m

Section C: Operational Information

	Sediments	Basement
Proposed Penetration: (m)	1400 What is the total sed. thickness? 1400 m	40
	Total Penetration: 1440 m	

General Lithologies: Forearc basin sediment unconformably laying on acoustic basin of Tertiary acc. Complex.

Coring Plan: *(Specify or check)*

Limited coring as necessary to confirm screen locations for CORKs

1-2-3-APC ☐ VPC* ☐ CB ☐ IDCB* ☐ PS ☐ RCB ☐ Re-entry ☐ HLAPC ☐

* *Systems Currently Under Development*

Wireline Logging Plan:

Standard Tools	Special Tools		LWD
Neutron-Porosity ☐	Borehole Televiewer ☐	Formation Fluid Sampling ☐	Density-Neutron ☐
Litho-Density ☐	Nuclear Magnetic Resonance ☐	Borehole Temperature & Pressure ■	Resistivity-Gamma Ray ☐
Gamma Ray ☐	Geochemical ☐	Borehole Seismic ☐	Acoustic ☐
Resistivity ☐ ☐	Side-Wall Core Sampling ☐	Limited measurements if needed to ll gaps from previous (Phase I) rilling.	
Acoustic ☐ Formation Image		Others ( )	Others ( )

Max.Borehole Temp. : *Expected value (For Riser Drilling)* _____°C

Mud Logging: *(Riser Holes Only)*

Cuttings Sampling Intervals

from _____ m to _____ m, _____ m intervals

from _____ m to _____ m, _____ m intervals

Basic Sampling Intervals: 5m

Estimated days:

Drilling/Coring: 4	Logging: 6 casing/CORK install	Total On-Site: 10 days

Future Plan: *Longterm Borehole Observation Plan/Re-entry Plan*

Long term monitoring (CORKs).

Hazards/ Weather:

Please check following List of Potential Hazards

Shallow Gas ☐	Complicated Seabed Condition ☐	Hydrothermal Activity ☐
Hydrocarbon ☐	Soft Seabed ☐	Landslide and Turbidity Current ☐
Shallow Water Flow ☐	Currents ■	Methane Hydrate ■
Abnormal Pressure ☐	Fractured Zone ☐	Diapir and Mud Volcano ☐
Man-made Objects ☐	Fault ☐	High Temperature ☐
H_2S ☐	High Dip Angle ☐	Ice Conditions ☐
CO_2 ☐		

What is your Weather window? (Preferable period with the reasons)

April-July: Avoid typhoon season

Form 2 - Site Survey Detail

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* □

'roposal #: 603D-Full	Site #: NT2-04A	Date Form Submitted: Sept. 30, 2004

	Data Type	SSP Requir-ements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection		Yes	Primary Line(s) :Location of Site on line (SP or Time only) JAMSTEC Line l Feb. 2003) Crossing Lines(s): JAMSTEC Line (Feb. 2003)
2	Deep Penetration seismic reflection		Yes	Primary Line(s): KR0108-4 Location of Site on line (SP or Time only) Crossing Lines(s):
3	Seismic Velocity†		Yes	Stacking velocity and migration velocity from MCS lines. OBS data.
4	Seismic Grid		Yes	
5a	Refraction (surface)		Yes	Two ship COP (maximum offset 20 km) obtained by JAMSTEC.
5b	Refraction (near bottom)		Yes	OBS data by Nakanishi et al. (1997)
6	3.5 kHz			Location of Site on line (Time)
7	Swath bathymetry		Yes	Multi-narrow-beam data by JAMSTEC R/V Yokusuka.
8a	Side-looking sonar (surface)		Yes	Some data collected using IZANAGI side scan sonar.
8b	Side-looking sonar (bottom)		No	
9	Photography or Video		Yes	Taken by JAMSTEC submersibles.
10	Heat Flow		Yes.	
11a	Magnetics		Yes	Compiled map published from AIST, Japan.
11b	Gravity		Yes	Compiled map published from AIST, Japan.
12	Sediment cores		Yes	Gravity and piston cores.
13	Rock sampling		No	
14a	Water current data			Available on JODC web page (http://www.jodc.go.jp)
14b	Ice Conditions			
15	OBS microseismicity		Yes	
16	Navigation		Yes	
17	Other			

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

Form 3 - Detailed Logging Plan

IODP Site Summary Forms:

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT2-04A	Date Form Submitted: Sept. 30, 2004
Water Depth (m): 1990	Sed. Penetration (m): 1400	Basement Penetration (m): 40

Do you need to use the conical side-entry sub (CSES) at this site? Yes □ No ■

Are high temperatures expected at this site? Yes □ No ■

Are there any other special requirements for logging at this site? Yes □ No ■

If "Yes" Please describe requirements: No logging planned. Site will have been logged in previous phase. CORK installation only

What do you estimate the total logging time for this site to be: 6 days (install casing/CORK)

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity		
Litho-Density		
Natural Gamma Ray		
Resistivity-Induction		
Acoustic		
FMS		
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)		
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	CORK	

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:
borehole@ldeo.columbia.edu
http://www.ldeo.columbia.edu/BRG/brg_home.html
Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Form 4 – Pollution & Safety Hazard Summary

IODP Site Summary Forms:

Please fill out information in all gray boxes

New ■ *Revised* □

Proposal #: 603D-Full	Site #: NT2-04A	Date Form Submitted: Sept. 30, 2004

1	Summary of Operations at site: (Example: Triple-APC to refusal, XCB 10 m into basement, log as shown on page 3.)	RCB with limited coring to confirm monitoring intervals for CORK to 1450 m. CORK installation
2	Based on Previous DSDP/ODP drilling, list all hydrocarbon occurrences of greater than background levels. Give nature of show, age and depth of rock:	None
3	From Available information, list all commercial drilling in this area that produced or yielded significant hydrocarbon shows. Give depths and ages of hydrocarbon-bearing deposits.	None
4	Are there any indications of gas hydrates at this location?	Yes, MCS profile shows BSR.
5	Are there reasons to expect hydrocarbon accumulations at this site? Please give details.	No
6	What "special" precautions will be taken during drilling?	May need casing to to stabilize shallow sediments.
7	What abandonment procedures do you plan to follow:	None. Holes will be CORKed.
8	Please list other natural or manmade hazards which may effect ship's operations: (e.g. ice, currents, cables)	Strong Kuroshio current. Typhoon season (June to Oct)
9	Summary: What do you consider the major risks in drilling at this site?	Current, instability of shallow sediments.

IODP Site Summary Forms:

Form 5 – Lithologic Summary

New ■ *Revised* □

New

Proposal #: 603D-Full	Site #: NT2-04A	Date Form Submitted: Sept. 30, 2004

Sub-bottom depth (m)	*Key reflectors, Unconformities, faults, etc*	*Age*	*Assumed velocity (km/sec)*	*Lithology*	*Paleo-environment*	*Avg. rate of sed. accum. (m/My)*	*Comments*
seafloor		Holocene to Late tertiary	1.5-2	Turbidites and hemipelagic sediments	Forearc basin sediments		
1400	Unconformity						
1450	Total depth						