JOIDES LITHOSPHERE PANEL:

MINUTES OF 11-13 OCTOBER 1990 MEETING

TOKYO, JAPAN

EXECUTIVE SUMMARY

4.0 SHORT-TERM PLANNING

4.2 Leg 136 - Oahu Pilot Hole

Given that time constraints will not permit continuous coring into basement (and LITHP does not wish to divert time from other higher priority objectives), LITHP supports the recovery of at least the last basalt core from the base of the hole. Characterization of the oceanic crust at this site and its relation to Hawaiian hot spot volcanism addresses a LITHP objective.

4.3 Leg 137 - Engineering Leg to Hole 504B

LITHP strongly recommends that Leg 137 carry the equipment necessary to set the liner if the casing is bad and to mill with small diameter tools in order that the future of drilling at Hole 504B can be established on the first Engineering Leg.

Given that time constraints would not permit setting a hard rock guide base at either EPR or Hess Deep, LITHP recommends the following contingencies for any time available during Leg 137 (listed in order of priority):

a) Additional logs and downhole measurements (FMS, wireline packer, flowmeter/packer, digital televiewer) be run.

b) Investigation of the hydrogeochemistry of the sediments and upper basement near Site 504 (as suggested in proposal 123/E of Mottl et al.).

c) Logging sediments near Site 504.

5.0 LONG-RANGE PLANNING

5.1 LITHP strongly recommends that PCOM establish a working group on offset drilling at its November meeting.

Its mandate should include:

- to establish and prioritize scientific objectives of a program for drilling offset sections of the crust and upper mantle.
- to identify sites where specific objectives can be addressed.
- to identify other information necessary to determine the structural and tectonic context of a drilling program.

5.2 East Pacific Rise Bare Rock Drilling

After reviewing the EPRDPG report, LITHP recommends that if drilling is progressing well at EPR-1, the time allocated to set the guidebase at EPR-2 (about 8 days) be used to continue drilling at EPR-1.

5.3 LITHP Prioritized Drilling Programs for FY'92

Six of the nine programs for the Pacific were ranked by LITHP--the other three were omitted as not within LITHP thematic interests. Three programs very highly ranked by LITHP were (in order): 1) EPR Bare Rock Drilling, 2) Hess Deep, 3) Sedimented Ridges II.

The other three proposals ranked by LITHP received notably lower ratings and were (in order): 4) Chile Triple Junction, 5) Cascadia Margin, 6) Atolls and Guyots.

6.0 OTHER BUSINESS

6.4 Next Meeting

14-16 March 1991, La Jolla, California. Host: J. Phipps-Morgan.

JOIDES LITHOSPHERE PANEL:

MINUTES OF 11-13 OCTOBER 1990 MEETING

TOKYO, JAPAN

Attending: T. Brocher, J. Erzinger, J. Franklin, S. Humphris, J. McClain, C. Mevel, D. Moos, M. Perfit, J. Pierce, J. Phipps-Morgan, G. Smith, Y. Tatsumi

Liaisons: K. Becker (PCOM), R. Buck (TECP), J. Allan (TAMU)

Regrets: R. Batiza, L. Cathles, S. Cloetingh, J. Mutter

WELCOMING REMARKS

T. Fujii welcomed the panel to the Ocean Research Institute, Tokyo and discussed meeting logistics.

S. Humphris welcomed D. Moos and Y. Tatsumi as the new members of LITHP.

1.0 LIAISON REPORTS

1.1 PCOM (K. Becker)

At present, the official liaisons from PCOM are J. Natland and J. Malpas, although liaisons may be rearranged at the next PCOM meeting. LITHP wishes to thank K. Becker for acting as liaison for the Tokyo meeting.

At its 14-16 August meeting in La Jolla, PCOM discussed the results of the test of the diamond coring system (DCS) during Leg 132. A number of problems remain, but the DCS system has proved itself capable of drilling and coring in fractured basalts. PCOM considered a proposal to insert another test of the system at Loihi Seamount immediately following drilling of the Oahu Pilot Hole in order to gain more experience with the DCS prior to scientific drilling. The proposal was turned down, and PCOM determined that the next test of the DCS will take place as planned at the EPR axis.

Schedule changes were approved by PCOM for two other legs. Three days were added to the Oahu Pilot Hole Leg to enable testing of a mechanical seal for reentry cones. The ODP Reentry Cone Seal is critical for the scientific work to be completed during the Sedimented Ridges and the EPR Bare-Rock Legs. Six days were added to the Engineering

the EPR Bare-Rock Legs. Six days were added to the Engineering Leg at Site 504B after consideration of the possible scenarios and their time estimates.
The recommendation was made to PCOM by the ad hoc Strategy Committee (STRATCOM) that, in order to facilitate renewal of ODP, six themes should become the focussed effort for future ocean drilling:

- high resolution Neogene paleoceanography transects
- sea-level studies
- deep drilling to understand structure and fluid dynamics of accretionary prisms
- evolution of passive margins
- evolution of sedimented and unsedimented ridge crests
- offset drilling for deep lithosphere objectives.

This focussed approach was not endorsed, and ODP will stay with the Long Range plan. STRATCOM will continue to work on the best ways to present ODP accomplishments in order to enhance the chances of renewal.

PCOM established mandates and membership for the North Atlantic Rifted Margin Detailed Planning Group and the Deep Drilling Working Group that were established at the PCOM meeting in Paris. In addition, two new groups were formed and their mandates determined: the North Atlantic Arctic Gateway Detailed Planning Group and the Sea Level Working Group.

PCOM asked that panels help inform the community that proposals for add-on science opportunities will be considered, and that a mechanism for handling such requests needs to be in place. This is to be discussed at the Panel Chairmen's Meeting in November.

At the Annual Meeting in Hawaii in late November, the FY'92 Program Plan will be determined based on the rankings of the candidate legs by the thematic panels.

1.2 Ocean History Panel (G. Smith)

Guy Smith presented a brief report on the last OHP meeting (29-31 March 1990). Ranking of proposals was the primary purpose of the meeting. OHP is very interested in North Atlantic drilling, particularly at conjungate margins, which may provide for some multi-objective sites in coordination with LITHP. There was also interest expressed by OHP in deep drilling capability, which would be communicated to PCOM.

1.3. Downhole Measurements Panel (J. McClain)

Jim McClain reported on the 28-29 June 1990 meeting of DMP in Seattle. Primary objectives of the meeting were to review the logging experiences during the Nankai leg and the downhole measurement plans for CEPAC, and to assess the status of the high-temperature logging needs.

The Nankai drilling was disappointing in terms of log productivity due to poor hole conditions and strong currents. The currents caused vibration of the drill pipe that damaged some instruments and caused the toolstrings to start unscrewing. In addition, there were serious hole stability problems. Similar problems of hole instability were encountered during Leg 110 (Barbados). In view of the possible drilling of Cascadia, DMP recommended that TAMU/TEDCOM carry out a review of drilling difficulties in such environments and that solutions be developed to the hole stability problem to permit logging.

High temperature logging tools developed by JAPEX (Japan Petroleum Exploration Co.) might now be available for use by ODP. A system, rated to 450°C, which includes temperature, pressure and spinner tools as well as sonic, laterolog and borehole fluid samplers, was developed in 1985 (all tools are slimhole). These need to be run separately, but combination tools are under development. Sandia has a slimhole temperature tool and fluid sampler, and some moves have been made towards a TAMU/Sandia research agreement for the development of high temperature tools. DMP will continue to monitor progress in this area.

Testing of the Geoprops Probe, which is needed for Sedimented Ridges I, is imminent. DMP recommended that, if land testing is satisfactory, Geoprops should be subjected to sea trials during Leg 135.

The Lateral Stress Tool (LAST) has been successfully used in measurements of in situ lateral stress and pore fluid pressure in three out of six deployments.

Recommendations from DMP that had been submitted to PCOM from previous meetings included:

1) Continued development of high temperature, slimhole tools
2) Renewed drilling at Hole 801C
3) Investigation of reaming technology for DCS holes
4) Shipboard integration of core and log data
5) Membership in industry consortium to develop logging technology
6) Use of a borehole magnetometer in Hole 504B.

1.4 Tectonics Panel (Roger Buck)

Since the last meeting of TECP included a joint meeting with LITHP, Roger Buck briefly reported on the ranking of proposals that was completed in a separate session. The very recent proposals for drilling in mid-ocean ridge environments using the offset hole strategy (that LITHP had ranked highly) had not been included in the TECP rankings since they had yet to be reviewed.

2.0 PROPOSAL REVIEWS

2.1 Proposal 233E Rev/3 - Central Oregon Accretionary Process (J. Moore et al.)
This mature proposal to drill the Cascadia Complex addresses a number of questions which, although not within the high priority thematic objectives of LITHP, are important. Downhole measurements need to be a major part of the drilling program; logging has not been emphasized enough in this proposal. However, this problem has largely been rectified by the report of the Cascadia Detailed Planning Group.

2.2 Proposal 265/D Add - Western Woodlark Basin (S. Scott et al.)
This letter provides an update on recent developments and near-future plans for studies in the Western Woodlark Basin. LITHP appreciates receiving this information and looks forward to receiving a revised proposal.

2.3 Proposal 317/E Add/2 - Northern Cascadia subduction zone (R. Hyndman)
Although not within the mandate of LITHP, it would be interesting to test the model because of both the pure and applied scientific interest in bottom simulating reflectors (BSRs). Geophysical logs should be available from previously drilled BSRs, and it may be possible to determine whether free gas is present. The proposed drill sites on the northern Cascadia accretionary wedge appear to be well documented.

The question of whether the outer drill string could be used as a riser with the DCS system for drilling a BSR was raised. After the meeting, J. Allan reported from the engineers that this is not possible at the present time and requires the DCS Phase III system to be operating. This would be a long-term development project.

2.4 Proposal 377/E Rev - Oahu Pilot Hole (G. Purdy and A. Dziewonski)
LITHP strongly endorses this proposal to drill a test hole northeast of Oahu as an OSN site. This is one of LITHP's four high priority thematic objectives, and the site is already scheduled for drilling.

2.5 Proposal 385/E - Oahu Pilot Hole Sediments (B. Keating)
Due to the long wavelengths (1-100's km) of most interest to the broad-band (i.e. low frequency) seismologists, LITHP feels that the VSP and logging proposed by Purdy and Dziewonski will adequately define the physical and acoustic properties for the proposed OSN.

The other stated objectives for coring the sediment do not address high-priority objectives of this panel.

2.6 Proposal 385/E Add - Oahu Pilot Hole Stratigraphy (C. Helsley)
Sampling oceanic basalts from the OSN Site to characterize geochemically and isotopically that piece of lithosphere and its relation to the Hawaiian hot spot volcanism addresses LITHP objectives. Whether the time necessary for basement coring is available or would have to be diverted from other, higher priority LITHP drilling is a serious concern. Coring the sediment is not within LITHP's area of interest; however, the panel strongly advocates that, given the time constraints, some time be reserved for the acquisition of at least the last basalt core from the base of the hole.

2.7 Proposal 378/A Rev - Barbados Accretionary Wedge (G. Westbrook et al.)
Although not addressing high priority LITHP objectives, there is some interest in the holes to study fluid processes. The link between the laudable goals of this proposal and the proposed drilling program is not clearly defined. This is of particular concern when a 3-4 leg program of 23 holes is unlikely. Hence, the proponents need to demonstrate how a subset of these goals can solve some of the outstanding problems.

The fluid processes goals are interesting but it would be helpful to see some modelling to demonstrate that pressure gradient determinations at three points will allow conclusions to be drawn about fluid flow.

This proposal will also require further development of tools and techniques for downhole measurements, which are particularly important in view of the nature of the Barbados prism and the problems encountered at Nankai Trough.

2.8 Proposal 379/A - Mediterranean Sea (J. Mascle)
This consists of two immature proposals of which only the first--to drill a 1-1/2 km mantle section in the Tyrrhenian Sea--is of LITHP interest, and is the only current proposal to drill mantle in this environment. Arguments for drilling to 1-1/2 km need to be expanded, and the implications beyond the regional problem within the Mediterranean Sea need to be examined. Of particular importance is how this drilling program may relate to ophiolites with back-arc affinities--these ideas need to be developed more fully.

2.9 Proposal 380/A Rev - VICAP (H. Schmincke et al.)
This proposal was reviewed at the March 1990 meeting, and comments included in the March Meeting minutes.

2.10 Proposal 382/A - Vema Fracture Zone (E. Bonatti)
Drilling into the lower crust and upper mantle are among LITHP's high priority objectives. In addition, investigation of vertical tectonics on a strike-slip fault could be an exciting endeavor. In terms of the first objective--structural and geochemical variations in the

lower crust and upper mantle--specific drill sites need to be identified (i.e. are there benches on the wall with a low slope and no talus cover that can be drilled?). In addition, the relation between this proposal and the French proposal (Auzende et al.) to drill the layer 2/3 boundary further upslope should be examined.

Further development of the objectives to study the vertical tectonics is needed. It is not clear that the proposed drilling will distinguish between the numerous hypotheses presented for vertical tectonics at fracture zones (in fact, many of those presented will account for only a few hundred meters of displacement). Can sampling of the carbonate be completed by dredging?

2.11 Proposal 383/A - Aegean Sea (K. Kastens et al.)
Although mostly of interest to TECP, the third objective of drilling into the "volcanic bodies" may be of interest to LITHP if they are indeed volcanic. It would be helpful if geophysical data, perhaps gravity data, could be used to assess what these bodies are or, at least reduce the possibilities (eg. could they be serpentinite diapirs, salt domes, etc.?).

2.12 Proposal 384/A Rev. - Venezuela Basin (A. Mauffret et al.)
This is an immature proposal that focusses mainly on paleoceanography. However there are two major objectives that are of interest to LITHP:
1) understanding the formation of the Caribbean oceanic plateaus
2) sampling the "native" Caribbean crust below the B" horizon.
However, the justification for the large amount of drilling requested has not been developed significantly beyond that presented in the previous proposal (343/A). The proponents need to better document how they would investigate the Caribbean window, list the specific objectives for each drill site, and indicate how this information will lead to a better understanding of lithospheric processes. There needs to be a clear problem definition and a concise statement of how the problems will be addressed by drilling.

2.13 Proposal 386/E Rev. - California Margin Drilling (M. Lyle et al.)
This proposal for California margin drilling includes no basement sampling and is not within the mandate of LITHP.

2.14 Proposal 286/E Add/2 - Hole 504B (K. Becker)
This was not a proposal, but rather a letter listing the options near Site 504 as contingencies if time is available during Leg 137. Hence, these options were considered as part of LITHP's overall discussion of Leg 137, and the conclusions are listed elsewhere in these minutes.

2.15 Proposal 387/E Rev. - Hess Deep (K. Gillis et al.)
LITHP strongly feels that the scientific objectives of this proposal are among its highest priorities. Hess Deep is presently the best place to investigate the nature and composition of the crust and upper mantle at a fast-spreading ridge.

Figure 1 points out that the structure at Hess Deep is complicated and subject to different interpretations. If the proposed drilling is going to result in a multi-leg program, then a knowledge of the regional geophysical context is absolutely essential. However, LITHP supports the view that a multi-channel seismics survey is not required prior to devoting a first leg to this project.

Interpretation of the data and analyses of the samples already collected needs to be completed as soon as possible to help elucidate the geological context, and to allow the Sites and their order of priority to be clearly defined. Consideration of the placement of seismic lines suggest that Area 3 should be deemphasized since it may be difficult to tie into later geophysical work, which would be more conveniently located west of 101°25'W. A site to address the tectonic objective (vertical versus horizontal tectonic displacement) could also be considered.

3.0 REPORTS ON RECENT DRILLING LEGS

3.1 Leg 132 - (J. Allan)
Leg 132 tested two pieces of equipment that are important to achievement of LITHP's objectives. The Phase II (4500m) DCS system, which includes the DCS, top drive, and secondary heave compensator, was field tested for the first time as an integrated system. It was deployed in conjunction with a new "mini" hard rock base (HRB) that is equipped with a gimballed reentry cone so it can be placed on a sloping ($\leq 20°$) hard-rock sea floor. Two drilling environments were planned--bare, fractured crystalline rock and a bedded chert/chalk sequence--but only the former was tested.

Site 809 was located on a small volcanic ridge on the Sumisu Rift in about 1850m of water. Some initial problems were encountered with setting the guide base and the reentry cone due to an underestimate of the buoyancy needed to right the cone to the vertical above its gimbal assembly. During further operations, the cone separated from the guidebase; however, both were retrieved separately. Once the guide base and cone--with additional flotation and an inclinometer--were in place on the seafloor, drilling began and penetrated 79 mbsf. Recovery of 64% was achieved in a highly vesicular basaltic unit demonstrating the potential of the DCS system. However, no recovery was obtained in an unconsolidated formation that was penetrated. A number of factors may have played a part: the design of the core catcher, the bit chosen, and the force of the circulating mud sprayed ahead of the core barrel.

Some redesign of two components are suggested by the Leg 132 experiences. The "mini" guide base should be mounted on three legs, the re-entry cone should be counterweighted

rather than held upright by flotation, and an inclinometer should be mounted to assess guide base orientation. There also needs to be more flexibility in core-barrel assemblies and a way to prevent circulating fluids from eroding unconsolidated material needs to be devised. An unexpected benefit of the techniques used for recovery and multiple placements of the HRB was the demonstration of the proficiency of handling heavy hardware and the new found capability of retrieving guide bases.

The next test of the system will be at the EPR in about 2800m of water during Leg 140.

3.2 Leg 133 - (J. Allan)
The primary objective of drilling on the northeast Australia margin and Queensland Trough/Queensland Plateau is to examine the sedimentary response to global sea-level changes of the Late Cenozoic. As of 30 September, this Leg has broken many previous records. Thirteen sites have been drilled with 5,103m of core recovered in 735 cores (in fact, they have run out of core liners!). Total penetration so far is 7679m.

The ship is now scheduled to go to Brisbane due to a shortage of fuel in Townsville. The cost for ship's fuel has increased by 50%. If fuel prices continue to stay high, fuel costs may increase by $1-3 million for the upcoming year.

4.0 SHORT-TERM PLANNING

4.1 Leg 135 - Lau Basin
This leg has now been extended to 68 days to include the 10-day transit originally scheduled. This has been done as a "cost avoidance" measure that amounts to about $175,000.

4.2 Leg 136 - Oahu Pilot Hole
At the PCOM meeting thee was considerable discussion about moving the hole to the arch south of Oahu, which is now the preferred site.

With regard to coring at this site, Helsley's proposal to core basement is of interest. However, LITHP does not want to divert time from other higher priority drilling to accomplish continuous basement coring. Hence, given the time constraints, LITHP supports recovery of the last basalt core from the base of the hole. Characterization of the oceanic crust at this site and its relation to Hawaiian hot spot volcanism is of interest geochemically and isotopically and addresses a LITHP objective.

4.3 Leg 137 - Engineering Leg to Hole 504B

K. Becker presented the updated scenarios for proceeding at Hole 504B during Leg 137 (Appendix A). LITHP's recommendation that downhole logs (temperature, fluid sampling and permeability) be completed prior to milling has been included in the overall plan.

Further progress then depends on the condition of the casing. During the last two pipe trips on Leg 111, an obstruction was encountered about 100m down in the casing, within a few meters of an expansion joint. However, whether this requires repair cannot be established until it is inspected. If the casing is good, chances of getting the hole open by milling operations are estimated to be about 75%. If milling and fishing are successful and there is time to drill ahead, a test of tri-cone bits against narrow kerf diamond core bits is planned. Since this test appears to be possible within the timing of tripping the whole drill string for bit changes, LITHP sees no conflict with their recommendation to core ahead. If milling is unsuccessful, plans need to be made for the remaining time. The options are discussed below.

If the casing is bad, the current plan calls for any repair to be deferred until the science leg. Repairs could require patching or setting a new liner, after which milling with small diameter tools would be attempted to open the hole.

LITHP feels that this additional engineering work should not be left until the science leg to 504B since it delays determination of the viability of the hole for scientific drilling--and would require scheduling a leg to a hole that may not open for drilling. Hence, LITHP strongly recommends that Leg 137 carry the equipment necessary to set the liner if the casing is bad and to mill with small diameter tools in order that the future of drilling at Hole 504B can be established on the first Engineering Leg.

A number of scientific options are available should time arise during Leg 137. LITHP has already recommended that a full logging program be carried out prior to abandonment. The enhanced geochemical resolution tool will not be available and the sidewall coring tool will not fit in the hole. However, FMS, wireline packer, flowmeter/packer, and digital televiewer tools should be run before any recasing program. The time estimate to run the available tools is about 4 days.

Setting a hard rock guidebase at either the East Pacific Rise or at Hess Deep would be an attractive alternative. However, unless 504B is abandoned very early in the Leg it is unlikely, given the transit times to Hess and EPR, that there would be time to complete this objective.

Another possibility may be to drill a new hole nearby without coring. Such a hole may be useful for cross hole tomography experiments and to determine crustal heterogeneity on some scale depending on the separation of the holes. Such a strategy has been adapted at the KTB Site, where a new hole offset by 200m is now being drilled but not cored. However, cuttings from the hole are being recovered using the riser system--an option not

available on the vessel. Consideration of a similar plan near Hole 504B would require a proposal and discussion of the optimum relative position of such a hole, as well as assessment of alternative sites for drilling a deep hole.

Investigation of the hydrogeochemistry of the sediments and upper basement near Site 504 (proposal 123/E of Mottl et al.) would provide information on flow rates and geochemical fluxes at high heat flow areas. This data set would provide a good comparison with that to be obtained at Middle Valley during the Sedimented Ridges I drilling leg.

LITHP therefore recommends the following contingencies for any time available during Leg 137:

1. Additional logs and downhole measurements should be run prior to any recasing program and before the hole is abandoned.

2. Hydrogeochemistry of the sediments and upper basement near Site 504 to determine flow rates and geochemical fluxes should be investigated.

3. Any additional time should be spent logging the sediments near Site 504.

5.0 LONG-RANGE PLANNING

5.1 Planning for Offset Drilling

One of LITHP's highest objectives is to investigate the structure and composition of the oceanic crust and upper mantle, and its variation with age, tectonic setting, and spreading history. In order to evaluate this, drilling needs to include both recovery of a complete crustal section, and a program of offset drilling to obtain partial sections of deep crustal layers and upper mantle. Total crustal penetration will require continued advances in the technological progress being made, and hence is a long-term objective. However, drilling of offset sections could provide a strategy to systematically study lateral variability in crustal structure with more immediately available drilling capabilities. As evidenced by the results of the workshop on Drilling the Oceanic Lower Crust and Mantle (DOLCUM) and by the number of drilling proposals submitted that employ this strategy, there is considerable community interest in using offset drilling to investigate the crust and upper mantle.

However, in order to optimize the scientific return from drilling offset sections in a number of different tectonic settings, an integrated strategy for study is required. The scientific problems that can be investigated need to be clearly defined, and a drilling plan needs to be developed. This is essential to allow further progress to be made on characterization of the crust and upper mantle. Hence, LITHP strongly recommends that PCOM establish a working group on offset drilling at its November meeting. Both the DOLCUM report,

and a large number of drilling proposals by several groups are available for discussion.

The mandate of an Offset Drilling Working Group should include the following:

- establish and prioritize scientific objectives of a program for drilling offset sections of crust and upper mantle.
- identify sites where specific objectives can be addressed
- identify other information necessary to establish the structural and tectonic context of a drilling program.

LITHP suggests the following panel membership:

John Bartley (U. Utah)
Enrico Bonatti (LDGO)
Jack Casey (U. Houston)
George Ceuleneur (Toulouse)
Henry Dick (WHOI
* Jeff Fox (URI)
Kathy Gillis (WHOI)
Greg Harper (SUNY)
Jeff Karson (Duke)
Jian Lin (WHOI)
Catherine Mevel (Paris)
John Mutter (LDGO)
(or John Orcutt (Scripps))
** Jason Phipps-Morgan (Scripps)
Dave Vanko (Georgia State)

* Suggested chairman
** LITHP liaison

5.2 East Pacific Rise Bare Rock Drilling

A draft copy of the EPR Detailed Planning Group report establishes 9°30'N as the preferred segment for drilling with the 12°50'N segment being an alternate site if formational difficulties are encountered.

Three sites have been identified in the 9°30'N segment, with EPR-1 being the preferred location of a deep hole to 1500m. It is proposed that, during Engineering Leg 3B, guidebases be set at both EPR-1 and EPR-2. It is not clear why the guidebase will be set for EPR-2 during this Leg when, if EPR-1 becomes an established site, no drilling will be done at EPR-2 until the 5th Leg of the bare rock drilling program. If drilling at EPR-1 is proceeding well, then significant penetration could occur on the Engineering Leg. LITHP has previously recommended that a small scientific party be on board the Engineering Leg to handle samples and help make scientific decisions during the Leg.

LITHP recommends that if drilling is progressing well at EPR-1, the time allocated to set the guidebase at EPR-2 (about 8 days) be used to continue drilling at EPR-1.

Temperature is a critical parameter to measure in the downhole operations. In order to make these measurements, the need to case the hole must be considered. Since casing a DCS hole is currently not possible (and is being looked at in the long (10 year) time scale in terms of nested drill strings), testing the reaming bit is important during the first Engineering Leg.

5.3 Ranking of Pacific Proposals for the FY'92 Program

LITHP considered the nine programs described in the Pacific Prospectus for drilling in 1992. Six of the proposals were considered to be of LITHP interest and were included in the rankings. The other three--Bering Sea History, Gas Hydrate Formation, and North Pacific Transect--were omitted as not within the mandate of LITHP. The ranking is as follows:

Rank	Program	1st Place	2nd Place	3rd Place	4th Place	5th Place	6th Place
1	EPR Bare Rock Drilling	8	4	-	-	-	-
2	Hess Deep	3	6	3	-	-	-
3	Sedimented Ridges II	1	2	8	-	1	-
4	Chile Triple Junction	-	-	1	5	3	3
5	Cascadia Margin	-	-	-	4	5	3
6	Atolls and Guyots	-	-	-	3	3	6

EPR Bare Rock Drilling: drilling at 9°30'N will elucidate magmatic and hydrothermal processes at fast-spreading ridges.

Nominations for co-chief scientists:

R. Batiza	R. Hekinan
C. Langmuir	J. Cann
J. Francheteau	A. Saunders

Hess Deep: Sections of the Layer 2/3 transition and of Layer 3 addresses high priority LITHP objectives. Detailed analyses of the available video and photographic data are required soon to clearly define specific drilling sites.

Nominations for co-chief scientists:

H. Dick	J. Karson
J. M. Auzende	J. Malpas
J. Francheteau	C. Mevel
K. Gillis	J. Natland

Sedimented Ridges II: addresses fundamental hydrogeological and geochemical problems in the formation and evolution of sediment-dominated hydrothermal systems, which are of strong interest to LITHP.

Nominations for co-chief scientists:

R. Zierenberg	J. Morton
Y. Fouquet	H. Baecker
P. Herzig	

5.4 Deep Drilling Working Group

The Deep Drilling Working Group met in September to begin identifying the technologies that exist or need to be developed to achieve deep penetration. The two technical problems most discussed in connection with deep drilling were:

i) **hole stability** - which may require a sophisticated mud program that is currently not possible on the Resolution

ii) **hole deviation** - any inclined bedding will deflect the hole from vertical, causing difficulties for setting casing or running logging tools.

In addition, there is concern that, with the present level of effort, deep drilling capability may not be feasible.

However, in order to proceed further and better evaluate the situation, the TEDCOM engineers need more specific information as to the objectives and targets of deep drilling. Hence, LITHP and TECP have been asked to provide this information in the form of "example" sites, with details of anticipated lithologies, temperatures, permeability, etc.

Deep crustal drilling has long been a high priority for LITHP, and is one of four goals delineated in the LITHP Long Range Planning Document (White Paper). There are a number of important objectives that can be addressed only by deep crustal penetration:

a) interpreting the geological significance (i.e. providing ground-truth data) of the seismic models of the oceanic crust.

b) determining the nature of hydrothermal interactions and the depth of penetration of seawater into the oceanic crust.

c) providing ground truthing for crustal reconstructions based on drilling offset sections

d) recovering a section of "normal" crust and mantle rather than that from anomalous regions (e.g. fracture zones)

e) investigating deformation related to MOR processes in an undisrupted crustal section

f) drilling into seaward-dipping reflectors at passive margins

g) investigating geochemical cycling and the nature of the crust at subduction zones.

In response to the Working Group's request for "example" sites, LITHP has selected the following:

i) Zero-age crust at fast and slow spreading centers
ii) 3 km penetration off axis at fast and slow spreading centers
iii) 6 km penetration off axis at fast and slow spreading centers
iv) 4-5 km penetration through seaward dipping reflectors at a passive margin
v) 4 km penetration in a subduction setting.

Specific examples for each of these have been developed. These are currently being finalized by LITHP, and will then be forwarded to the Deep Drilling Working Group.

5.5 ODP's Long-Range Plan

LITHP began addressing PCOM's charge to consider development of implementation plans for the Long Range Plan. For each of the major objectives of interest, i.e.

1) Exploring the Structure and Composition of the Lower Oceanic Crust and Upper Mantle
2) Magmatic Processes Associated with Crustal Accretion
3) Intraplate Volcanism
4) Magmatism and Geochemical Fluxes at Convergent Margins
5) Dynamics of Oceanic Crust and Upper Mantle (Global Seismic Network and stress measurements address LITHP objectives)
10) Hydrothermal Processes Associated with Crustal Accretion
11) Fluid Processes at Plate Margins,

LITHP assessed the current status of submitted proposals and available technology to achieve the goals. This preceded discussion of both other areas of interest that would require submission of proposals, and advances that would be necessary in drilling technology and geophysical techniques in order to meet the objectives. A draft summary of the results are in preparation, and will form the basis of further discussions at the next meeting.

5.6 Evaluation of the success of ODP in addressing COSOD I themes

Five of the 12 principal themes of COSOD I fall within the mandate of the LITHP, and accomplishments of ODP drilling legs have addressed aspects of all five. S. Humphris will prepare the draft one-page summary requested by PCOM, and it will be circulated to LITHP members for comment prior to the November Panel Chairmen's Meeting.

6.0 OTHER BUSINESS

6.1 Panel Replacements

R. Batiza, L. Cathles and M. Perfit are all due to rotate off LITHP. M. Perfit has suggested he remain a member for one more meeting since his sabbatical in Australia limited his LITHP activity during 1989-90. LITHP endorses his continuation until the March meeting.

Rodney and Larry have both provided a great deal of help and advice, and LITHP wishes to thank them both. Rodney's additional work and leadership as Chairman is also greatly appreciated. LITHP recommends the following replacements:

R. Batiza's replacement:

1) J. Bender (UNC)
2) P. Michael (U. Tulsa)

L. Cathles' replacement:

1) M. Reed (U. Oregon)
2) R. Zierenberg (USGS)

C. Mevel is also rotating off. LITHP wishes to extend its thanks to Catherine for her long and valuable service, both as a panel member and as liaison to TECP.

6.2 LITHP liaisons and representation on working groups

Seird Cloetingh has been nominated as LITHP's liaison to TECP. He has not yet accepted.

Jorg Erzinger has been appointed to replace John Mutter as LITHP's representative to the Deep Drilling Working Group.

If the Offset Drilling Working Group is created, LITHP will be represented by Jason Phipps-Morgan.

6.3 Vote of thanks

LITHP thanked T. Fujii and Y. Tatsumi for all their work in hosting the Tokyo meeting. In addition, those of us who attended the post-meeting field trip very much appreciated the opportunity to visit Oshima.

6.4 Next meeting

Jason Phipps-Morgan has offered to host the next LITHP meeting in La Jolla, California, 14-16 March 1991.

LEG 137

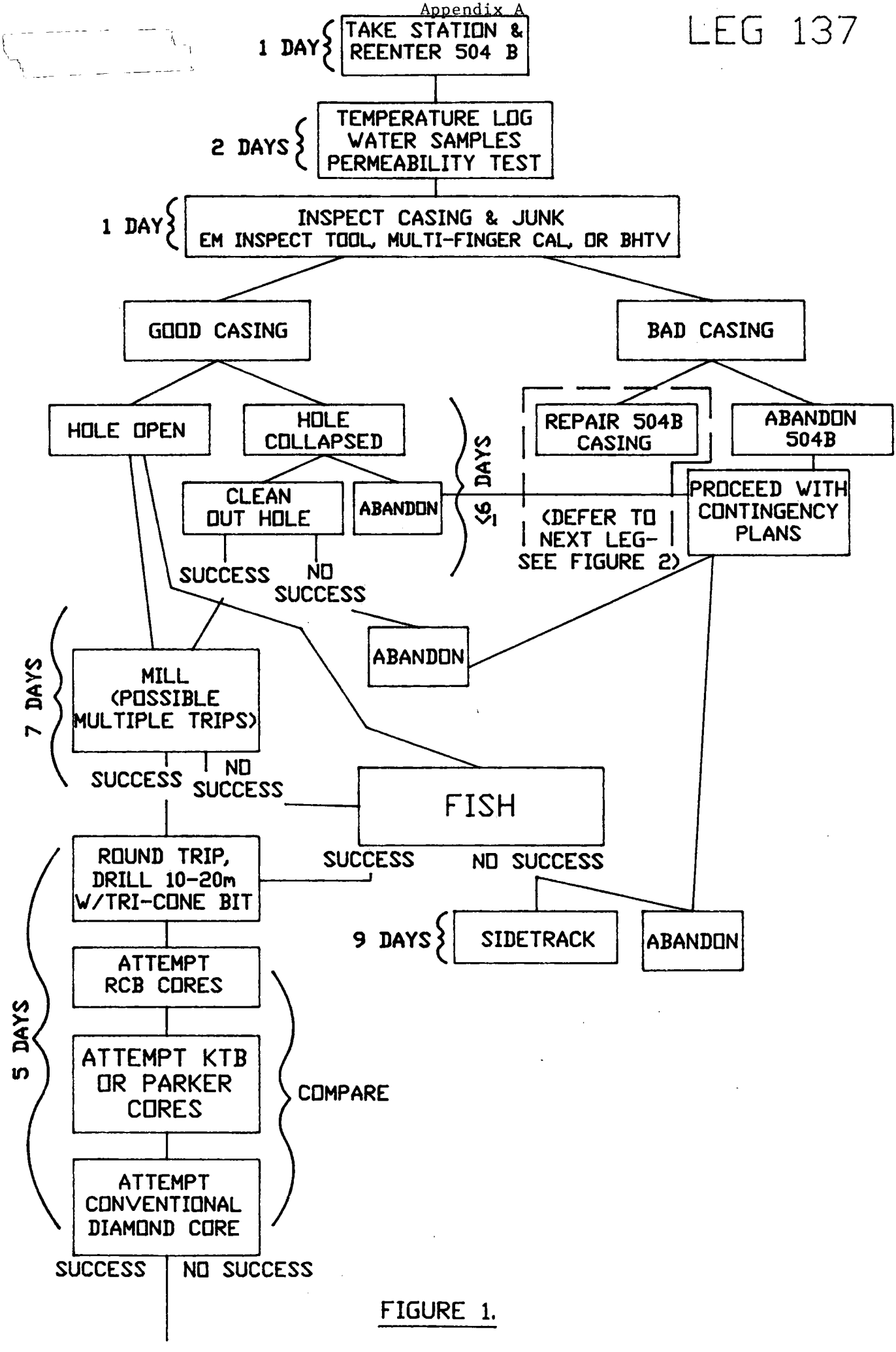

FIGURE 1.

504B REPAIR SCENARIOS

(FUTURE LEG)

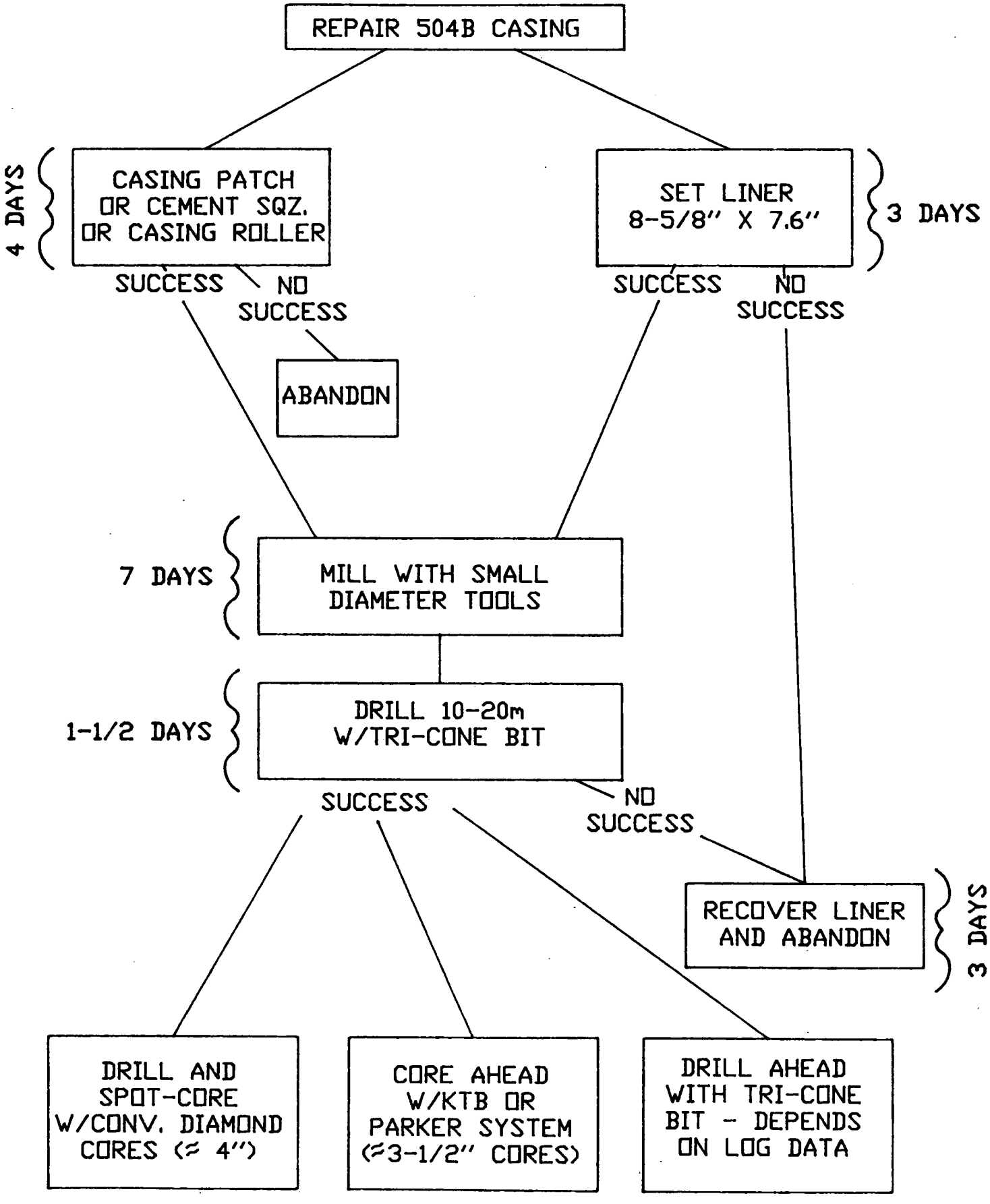

FIGURE 2.

SECOND 504B LEG SCENARIOS

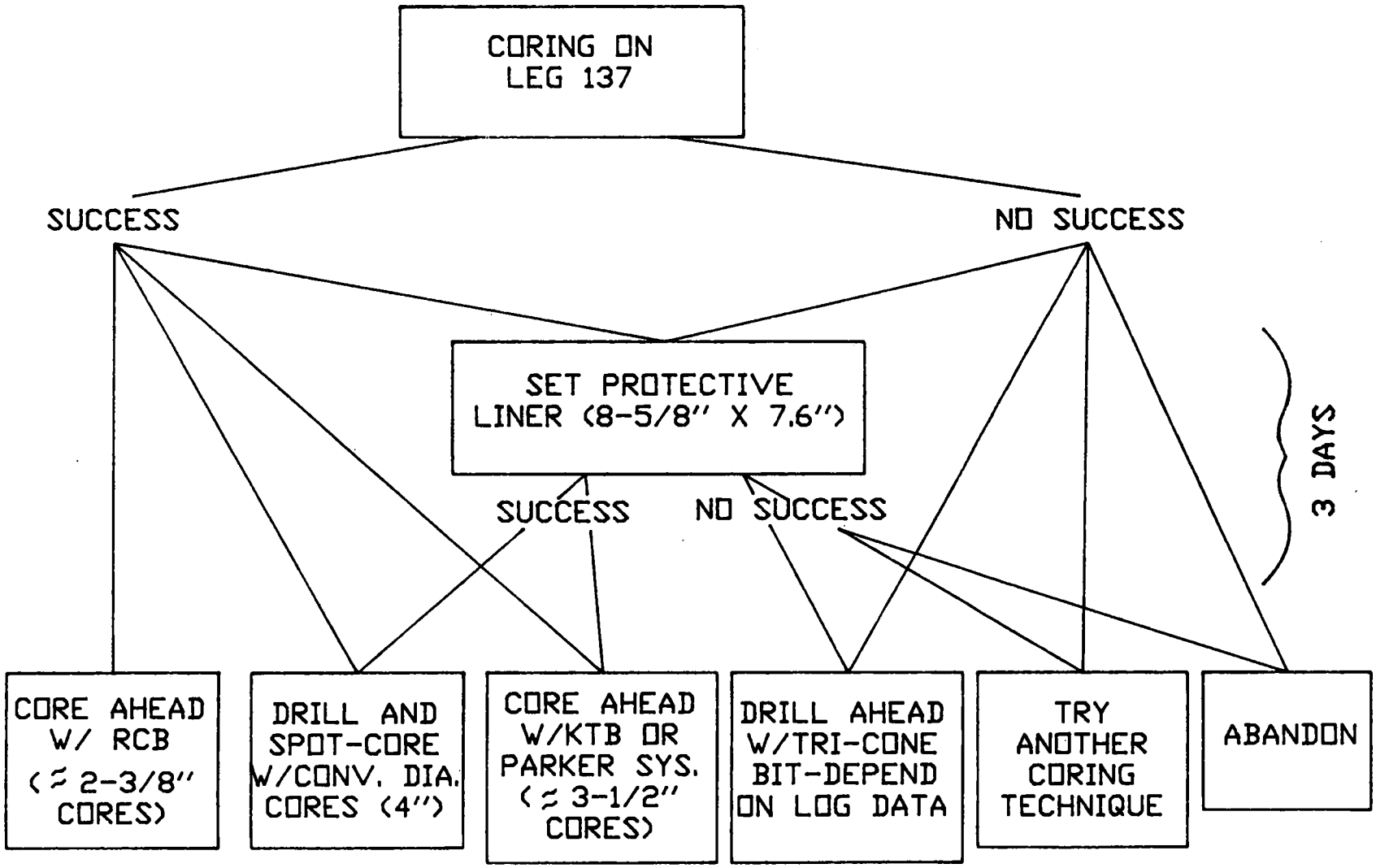

FIGURE 3.