

Agenda -1st Engineering Task Force Meeting October 2 and 3rd, 2006

Attendees

Members

Greg Myers
Earl Davis
Peter Looijen
Tom Pettigrew
Bernhard Prevedel
Tom Williams

Observers

Keir Becker
Tom Janecek
Gaku Kimura
Toshiyuki Oshima
Kelly Oskvig
Manik Talwani

Guests

Jun Fukutomi
Hisao Ito
Iain Pheasant
Derryl Schroeder

- **8:30 – 9:00 – Continental breakfast**
- **9:00 - 9:15 – Welcome and meeting logistics**
- **9:15 - Commence meeting**

1. What is the Engineering Task Force (ETF) and what are its goals

- a) Provide overview of how and why ETF was created and what the expectations are for ETF. Solicit comments and recommendations from members

b) Goals of this meeting are to:

- (1) consider technology advice from the IODP Science Advisory Structure (SAS) and implement engineering developments where appropriate
- (2) conduct review of Long Term Borehole Monitoring System (LTBMS) High Level Design Document and provide advice to IODP-MI on LTBMS technical feasibility based on review of document.
- (3) determine nature/need for future meetings

2. Discuss IODP-MI vision for engineering

- a) What are long-term IODP engineering goals? Discuss the vision for IODP engineering vision and how this may be realized. Solicit comments and recommendations from ETF members

3. Discuss process for proposals

- a) Discuss the draft process for how IODP-MI procures and handles engineering development proposals. Solicit comments and recommendations from ETF members.

4. Review of IODP science advisory structure advice

- a) What is the Science Advisory Structure (SAS) and how does IODP-MI interact with SAS?
- b) Review relevant recommendations from previous Engineering Development Panel and Science Planning Committee meetings.

• **10:15 – 10:30- Break**

• **10:30 - Resume meeting**

5. Discuss the IODP FY 2007 and 2008 engineering plan

- a) Review the projects put forth for FY 2007 and FY 2008 funding
 - (i) Long Term Borehole Monitoring System (LTBMS)
 - (ii) Pulse Telemetry Module (PTM)
 - (iii) Subsea Down-Pipe Camera System
- b) Solicit comments and recommendations from members

- **12:00 – 1:00pm lunch**
- **1:00pm - Resume meeting**

6. Long Term Borehole Monitoring System (LTBMS) – peer review evaluation of the feasibility study

a) Review plan to evaluate the LTBMS high level design document.

(1) LTBMS review will consist of large group discussion, individual review and executive session.

(2) For individual review, task force members will volunteer for sections they feel most capable of reviewing and will generate questions, comments, formulate opinions.

(3) During executive sessions, guests are encouraged to utilize the time to:

(a) consider EDP technology roadmap, drilling proposals, existing technology developments and then brainstorm possible FY 09 engineering development proposals for submission to IODP-MI in early 2007

(b) review the draft IODP-MI web page and provide comments

(c) discuss other engineering related issues to bring to IODP-MI for consideration, possibly proposal review and handling process

(4) Generate comments and questions for response to CDEX.

(5) CDEX will field questions and address comments

- b) Provide advice to IODP-MI on the next steps for the LTBMS initiative.
- c) Procurement process

- **5:00pm- Adjourn**
- **6:30pm – Dinner**

- **Day two - 8:30 – 9:00am - Continental breakfast**
 - **9:00 to 10:30 Continue LTBMS review**
 - **10:30 to 10:45 Break**
 - **10:45 - resume meeting**
- 7. Discussion of engineering best practices for IODP**
- a) How can IODP-MI ensure uniformity of engineering standards between platforms and contractors?
 - b) Is it feasible to implement a best practice guideline for IODP?
 - c) Does “systems engineering” have a place in IODP?
 - d) Solicit comments and recommendations from members
- 8. Engineering Task Force mode of operation**
- a) How can ETF be optimally configured to best implement engineering developments (meeting timing, agenda composition, attendees, etc)?
 - b) Solicit comments and recommendations from members
- 9. Review of recommendations and action items**
- **12:00 Adjourn meeting – lunch will be served**



Engineering Task Force

October 2-3, 2006, Washington, DC, USA

Location

IODP Management International
815 Connecticut Avenue, Suite 210
Washington, DC 20006
Tel: 202-465-7500

Date and Time

Monday, October 2, 2006

09:00 -17:00

Tuesday, October 3, 2006

09:00 – 13:00

Breakfast and lunch will be provided on both days. Continental breakfast available from 8.30 am.

Meeting Chair

Greg Myers
Engineering & Operations Manager, IODP-MI
gmyers@iodp.org

Hotel Information

Henley Park Hotel
926 Massachusetts Avenue, NW
Washington, DC 20001
Tel: (202) 638-5200

Rooms have been set-aside for the nights of Sunday, October 1 and Tuesday October 2 at the IODP-MI preferred rate of \$190 plus tax (currently 14.5%). Reservations can be extended at the same rate.

For more information on the hotel <http://www.henleypark.com>

To make a reservation (Important Deadline Information)

Please contact Thérèse Lowe at tlowe@iodp.org or 202-465-7503 on or before **Tuesday, September 5, 2006** (Cut off date) and state your arrival and departure dates along with any other requests.

Airport Transportation

Shuttle Service (Super Shuttle) to and from all local airports can be reserved prior to departure.

Online reservation: <http://www.supershuttle.com/htm/cities/dca.htm>

Telephone: (800) BLUE VAN / (202) 296-6662

Taxi Service to downtown DC:

Readily available curbside at airport with transportation officials to direct you.

From Ronald Reagan Washington National Airport (DCA):

Approx Fare \$12.00USD Duration: 20 minutes.

From Washington Dulles International Airport (IAD):

Approx Fare \$50.00USD Duration: One hour.

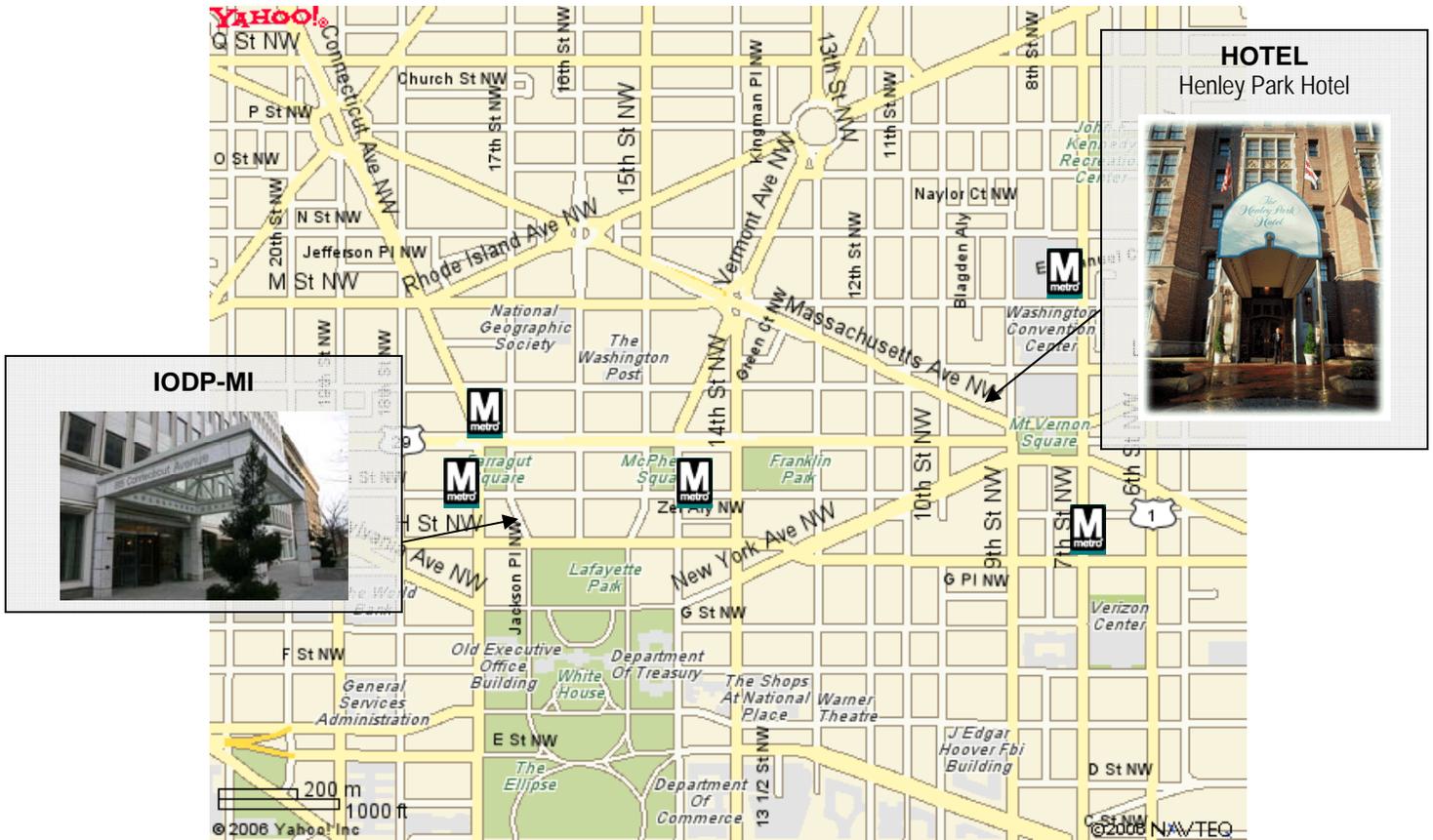
From Baltimore Washington International Airport (BWI):

Approx Fare \$60.00USD Duration: One hour

Metrorail

The Metro subway system (<http://www.wmata.com/>) stops at DCA.

For Henley Park Hotel take the YELLOW line to Gallery Place-Chinatown Station, or the BLUE line to McPherson's Square (20 minutes). For IODP-MI Offices take the BLUE line to Farragut West Station or the RED line to Farragut North Station. Each journey costs approx US\$1.35.



Expenses (For Task Force members being reimbursed by IODP-MI)

IODP-MI will cover expenses incurred for travel, lodging and meals as set out in its Travel Policy. Expenses will be reimbursed on submission of completed Expense Report and all *original* receipts for expenses over \$25.

If you need assistance, please contact Thérèse Lowe at (202) 465 7503 or tlowe@iodp.org

Per diem rates for Washington, DC (August rate)

Total \$ 214 with the following breakdown:

Meals \$64 (Breakfast \$12; lunch \$18; dinner \$31 and incidentals \$3)

Travel Policy and Up to date Expense Report:

<http://www.iodp.org/travel-forms-and-policies/>

IODP-MI Engineering Task Force

Washington, DC

October 2-3, 2006

Task Force Roster

Members

Earl Davis	Pacific Geoscience Centre, British Columbia, Canada
Brian Glass	NASA, Ames Research Center, California, USA
Peter Looijen	Fugro Research and Development, Leidschendam, The Netherlands
Greg Myers*	IODP-Management International, Inc, Washington, D.C., USA
Tom Pettigrew	Stress Engineering, Texas, USA
Bernhard Prevedel	International Continental Drilling Program, Potsdam, Germany
Alex Pyne	Antarctic Research Centre, Wellington, New Zealand
Tom Williams	Maurer Technologies, Texas, USA

Observers

James Allan	National Science Foundation, USA
Keir Becker	RSMAS, University of Miami, USA
Tom Janecek	IODP-Management International, Inc, Washington, D.C., USA
Gaku Kimura	Department of Earth and Planetary Sciences, University of Tokyo, Japan
Toshiyuki Oshima	Ministry of Education, Culture, Sports, Science, and Technology, Japan
Kelly Oskvig	IODP-Management International, Inc, Washington, D.C., USA
Yoichiro Otsuka	IODP-Management International, Inc, Washington, D.C., USA
Manik Talwani	IODP-Management International, Inc, Washington, D.C., USA

Guests

Jun Fukutomi	Center for Deep Earth Exploration, JAMSTEC, Japan
Hisao Ito	Center for Deep Earth Exploration, JAMSTEC, Japan
Derryl Schroeder	JOI Alliance (USIO), Texas A&M University, USA

* chair

IODP-MI Engineering Task Force
Washington, DC
October 2-3, 2006

Meeting Report

I. Welcome and meeting logistics

Commencement of meeting and signing of confidentiality agreement and conflict of interest statement. USIO and CDEX are to only sign the confidentiality portion.

Absent Task Force members:

Brian Glass – NASA

Alex Pyne – Antarctic Research Center

Absent Task Force guests:

Iian Pheasant - ESO

1. What is the Engineering Task Force and what are its goals

- A. Provide an overview of how and why the ETF was created and what the expectations are for the ETF. Solicit comments and recommendations from members.
- B. Goals of this meeting are to:
 - 1) Consider technology advice from the IODP Science Advisory Structure (SAS) and implement engineering developments where appropriate.
 - 2) Conduct a review of Long Term Borehole Monitoring System (LTBMS) High Level Design Document and provide advice to IODP-MI on LTBMS technical feasibility based on review of document.
 - 3) Determine nature/need for future meetings.

2. IODP-MI Engineering Vision

- A. What are long-term IODP engineering goals? Discuss the vision for IODP engineering vision and how this may be realized. Solicit comments and recommendations from ETF members

Vision Draft:

IODP-MI is committed to dramatically improving the technological capabilities of the scientific ocean drilling program, through hardware, software, techniques and processes. IODP technology development must be innovative and may be daring, while utilizing time proven engineering practices to ensure success. Technology initiatives must be part of the full spectrum of scientific challenges detailed by the scientific drilling community, yet not limited to solutions currently residing in the ocean and earth sciences. IODP-MI will facilitate the acquisition of existing or

latent technology through all possible avenues for the collection of requisite earth science data to further our understanding of earth and its complex systems.

Panel concurs with draft of vision.

3. Engineering Development proposal process

A. Discuss the draft process for how IODP-MI procures and handles engineering development proposals. Solicit comments and recommendations from ETF members.

G.M. gives proposal process presentation (included in this packet)

Questions and Comments:

T.P. : Once decided that development is needed, how do we get it done? What will IODP-MI do with the advice?

G.M.: In the example of a technology development proposal...we assist with the navigation of the proposal through the system, the proposal is ranked by SAS, if the proposal is included in the annual program plan, then when we are ready to consider implementation. On all phases of the process, we will work with the proponents. We are open to anyone who has a tool that will help achieve IODPs Initial Science Plan.

B.P.: Who does the project management?

G.M.: Under \$100k, let the contractor who submitted the proposal complete the project. If it's over \$100,000, more rigorous reporting is required and prior to commencement of work, we send out for an RFP or let the task force decide how to procure the tool...which is one of the things we would like to discuss today.

T.J.: IODP-MI is prime contractor to IOs, through program plan or to third party. The overall project management resides in IODP-MI.

T.W.: What is SAS?

G.M.: A group of panels makes up the Science Advisory Structure (SAS). Science Planning Committee (SPC) is top of the SAS. The group is mostly academic, but includes about 15 people from industry.

?: Who decides route of proposal?

G.M.: IODP-MI decides but may look to task force for guidance.

J.F.: Can we have a nondisclosure agreement up into the sort engineering development stage of the proposal process?

G.M.: Yes, but it can not stay confidential beyond the "proposal sorting" phase.

B.P.: Who has the power to decline?

T.J.: IODP-MI is the ultimate authority. The Engineering Development Panel (EDP) can only recommend one way or the other.

K.B.: Ranking of Engineering Developments is a ranking of ideas - brain storm of technologies that are needed or can be improved to accomplish IODP goals.

G.M.: We are now mapping existing proposals with the list, or "Roadmap". We look and see if proposals match the higher priorities on the development list. In coming years we may solicit RFPs to accomplish some of these priorities.

T.W.: How long does it take to develop a project?

G.M.: For larger projects it will take 2-3 years. Something under \$100k could happen more quickly.

T.J.: It takes about 11 months to ensure funding. If a project does not fit into the roadmap, the proposal probably won't be funded.

D.S.: Can IODP-MI fund a multi-million dollar project and will there be anything left for other developments?

G.M.: Yes.

T.J.: Lead agencies fund IODP-MI, part of the funds are allocated to engineering development. If we get other 3rd party funding, that's a different story as to how the funding is spent.

B.P.: IOs (Implementing Organizations) have freedom to develop their own thing with 3rd party funding. IODP-MI is not involved in this decision-making process.

T.J.: SOC (Science Operation Costs) and POC (Platform Operation Costs) funding overlap will hopefully be resolved by MEXT (Ministry of Education, Culture, Sports, Science, and Technology) and USIO (United States Implementing Organization)...don't want separate contracts for same thing. SOC and POC separation of funds came about because of liability reasons. Conflicts will probably be resolved through EDP meetings.

D.S.: Can you envision using commingled funds with IO funds?

G.M.: Yes, the main goal is to get engineering done.

G.M.: If we have a multi-year project, an engineering task force panel would be useful for determining if we are on track, how we should review the deliverables, is the technology being developed correctly / on track, etc. This is not directly related to the purview of Engineering Development Panel (EDP).

B.P.: What is the task force role exactly?

G.M.: Once a proposal works through the system, an RFP goes out or it is sole-sourced. The ETF needs to look and see if the engineering is feasible, if it can be done more appropriately, if it can be done on time and according to budget.

T.P.: We need a streamline way to get this done.

J.F.: How will we address needs of different proposals?

G.M.: We will bring in panel members with the expertise to fit the needs of the meeting, proposals to be reviewed, etc.

B.P.: We need to have a process for doing this which includes a process for review of project status and addition of members

G.M.: This is something we will discuss at the end of the meeting. How do we review these things, how do we utilize the task force members?

4. Review of IODP Science Advisory Structure (SAS) advice

- A. What is the Science Advisory Structure (SAS) and how does IODP-MI interact with SAS?
- B. Review relevant recommendations from previous Engineering Development Panel and Science Planning Committee meetings.

5. Discuss the IODP FY2007 and 2008 engineering plan

G.M. presents overview (included in this packet)

- A. Review the projects put forth for FY2007 and FY2008 funding

1) LTBMS General Description

- The plan for this meeting is that FY07 will commence following this meeting. Funds haven't been allocated to any vendor at the moment. We have 2 years of thinking and 2 years of manufacturing that can occur if we agree to let this proceed.
- Borehole will be 6000m – 8000m below sea level. It will be a deep borehole with a plethora of sensors (temp., strain-tilt, etc.), telemetry system, wireless link up to surface, wired observatory network, etc.
- Biggest problem is how do you get this thing into the borehole.
- Fluid sensors will not be developed by CDEX but they will do the integration into the system.
- System will be sealed for pressure measurements. Riser will be connected to well-head package.
- Long-term in this case means at least 5 years but will vary with sensor packages. Should have access to all depths for decades. It is the sensor's that will need to be replaced in 5 years.

2) Pulse Telemetry Module (PTM) Overview

- We are still waiting on the feasibility results.
- Next step is to send data to a pulser to send it up to the surface. So far as we know this does not currently exist...the ability to get real-time data while coring.

We agree with EDP advice. PTM applies directly to heave-related, drilling-dynamic related desires of the scientific community. In order for us to move ahead we need to see the system perform in the offshore environment. FY08 sea tests. FY07 – feasibility study to determine best way to integrate a pulser into the system.

- Purpose to measure torque, weight on bit, annulus pressure. Primarily to understand what's happening at the bit and improve coring.
- FY begins Oct. 1, so FY07 started yesterday.
- DSS has been proven in test well. Inductive coupling and powering were proven. The primary sensor did not read accurate readings. At the sea test, the tool had water in key compartments.
- PTM is a Class A project for FY07 and FY08. It will likely be Class B the following year if a proposal is submitted to construct the system.

Questions and Comments:

B.P.: We need a development plan, what is the technology, who is doing the project, where are the tests going to be done, objective for fiscal year in order to give an opinion.

G.M.: We just want to define how to test and prove foundational technology before we provide the funding. This group should acknowledge the project; the next step is for us to get a feasibility study and a proposal defining work break-down and costs.

B.P.: (In order to provide an opinion on the project) We need past data, what has failed, what has passed and what to do next.

P.L.: Fugro has stable bit while they are coring. They have a seabed template. They clamp the drill string to the seabed and you no moment from heave. PMT gives you sufficient data to understand the coring process with a moving drillstring but it does not provide data regarding the quality of the core. Depth limitation is 3500-4000m when using steel wire to have sufficient weight to balance heave. More than 4000m you need to go into synthetic wires.

B.P.: If you have stick-slip in the drill string, you get a cutting motion on the bit which can create harmonic motion in the core barrel and could hence break the pipe. Such a logging while coring tool would significantly improve wireline coring operation also for land operations.

P.L.: The Fugro system does compensate for this.

G.M. This could be used on multiple platforms and could provide us with useful information. For this proposal we want you to be aware of the technology, see if there are any omissions. When newer proposals come through we will need to look a lot more closely at it.

E.D.: The ETF needs to be closely connected to EDP. Logically we could be a subcommittee of EDP.

G.M.: They (EDP) will review the proposal and possibly rank it, but they don't suggest to go ahead or not. For this ETF meeting, we are not looking for a formal endorsement of the technologies being presented...we are looking for advice on how to put a plan into motion.

T.W.: Lithium batteries at 0 degrees C?

G.M.: The feasibility study addresses these issues.

D.S.: It won't be subject to temps lower than 3 or 4 degrees C unless on the drilling platform.

?: I'd Like to see the proposal and test results.

G.M.: We can certainly provide a summary sheet and the proposal. There have been quarterly reports done which are available on the web.

T.J.: There are 3 projects grandfathered into the system right now so part of the path forward is to determine how to best utilize the panel's expertise versus utilizing EDP which is more of a project prioritizing committee.

E.D.: We're here to promote success and prevent failure. Need a packet of just the right stuff distributed ahead of time. Need to know more so that the panel won't be so skeptical.

3) Down-pipe Camera

- Utilized successfully on Tahiti expedition. The project was in shallow water depths so they had ambient light. Determined live corals, slope, general environment, etc. Lowered camera by hand.
- ESO is proposing to make this down-pipe camera more robust including, improving enclosure, a swivel camera head and maybe adding a winch.
- Doing a feasibility study for FY07. This feasibility study will be completed by the next engineering task force meeting. EDP left it up to us as to how to move forward.
- Down-pipe camera is not on the technology roadmap, but it has science and operational benefits, thus the feasibility study was approved.

Questions and Comments:

B.P.: Can this be expanded into a high pressure, deep well capability?...

G.M.: This will be investigated in the feasibility study.

?: There will be a problem using this with a mud-filled hole.

G.M.: This is only for a hole with clear fluid...hard rock hole.

K.B.: This has been done before in a hard rock hole by the Marine Physical Laboratory at Scripps.

E.D.: Outside the benefits of logging, what are the benefits?

G.M.: The cable is running down the pipe so it is sheltered from current. It can be modified to go down-hole.

T.P.: It opens a door to doing a re-enty like sonar through pipe...keeps cable inside the pipe and allows a second cable outside the pipe that will stay there.

G.M.: We'll send out info on the feasibility study before the next meeting and take it from there. The proposed cost is \$80k - \$250k (depending on fiber optics, winch, *etc.*)

6. & 7. Long-term Borehole Monitoring System (LTBMS) peer review and evaluation of feasibility study

A. Presentation by CDEX – Hisao Ito

- Sensor Module by sub-party
- CDEX to do interface between downhole and sensor modules.
- 2 systems (for power and data transfer)
 - Seafloor cable system
 - Battery Module
- Major development elements: Data storage, low-powered sensors, reliability, temperature, telemetry, sensor interface, data compression, data harvest
- Systematic laboratory testing and field tests are the most important parts of their proposal

B. Review of Document

It was decided that the best way to review the document was to deal with the overall system first and then deal with the details last. Task force members then reviewed the document while CDEX is present so they can answer questions. When reviewing, task force members were asked to be mindful that installation issues are not part of the HLDD scope of work. Installation is CDEX's responsibility and not part of the feasibility of the system.

Review is captured in attached CDEX Long-term Borehole Monitoring System (LTBMS) High Level Design Document (HLDD) Review.

8. Evaluation of LTBMS Feasibility Study

Evaluation is captured in attached CDEX Long-term Borehole Monitoring System (LTBMS) High Level Design Document (HLDD) Review.

9. Discussion of engineering best practices for IODP

- A. How can IODP-MI ensure uniformity of engineering standards between platforms and contractors?
- B. Is it feasible to implement a best practice guideline for IODP?
 - 1. Yes, this makes sense and we can draft an outline within next 6 months
- C. Does “systems engineering” have a place in IODP?
 - 1. Formal adoption of engineering protocol, not necessary. However compatibility must be stressed.
 - 2. HSE is a good example of formal systems that could be adopted
 - 3. Reporting and change-control requirements would benefit
- D. Solicit comments and recommendations from members
 - 1. Minimal requirements are broadbrush project definition/description, critical path with simple milestones (Andy Fisher example, this is a monthly update cycle)
 - 2. DEEP STAR is a good example of systematic engineering (Jim Chitwood) Chevron

10. Engineering Task Force mode of operation

- A. How can ETF be optimally configured to best implement engineering developments (meeting timing, agenda composition, attendees, etc)?
- B. Solicit comments and recommendations from members
 - 1. The task force agreed to meet on an as-need basis.
 - 2. The task force will bring in the required experts depending on the agenda.
 - 3. The task force agreed to utilize time between meetings for document review, etc. Mail out an agenda package prior to meetings to bring task force up to speed on issues to be discussed. This will enable the task force to be more of a Q&A session rather than presentations.
 - 4. Large project audits should be conducted at the vendor’s site, with experts in attendance.

11. Review of recommendations and action items

- 1. Edit and review the minutes and circulate to ETF members (by Oct-5)

2. ETF adopt the minutes and draft a letter to CDEX regarding HLDD review (Oct-6)
3. CDEX edit the HLDD by taking consideration the review comments and CDEX return edited copy of HLDD (10-12)
4. IODP-MI will draft letter to Lead Agencies regarding LTBMS feasibility study (10-13)
5. IODP-MI and Lead Agency meeting (10-13...proposed)
6. Draft letter to CDEX on status of project (ASAP)
7. IODP-MI to develop a project management plan for large engineering projects
8. IODP-MI to development best practices document draft
9. IODP-MI to collect as much design criteria for LTBMS, such as well head and well design info, as possible and circulate to task force.
10. IODP-MI to send pending proposals for downpipe camera and pulse telemetry module to task force