

From: Sprague, Jonathan D
Sent: Wed Jun 03 23:41:26 2009
To: Thierens, Harry H; Rich, David A; Frazelle, Andrew E; Holt, Charles A; Little, Ian
Subject: FW: Process Safety Lessons for Mad Dog Consideration - June 3rd Meeting: Agenda and Pre-Read
Importance: High
Attachments: EP PSI guidance.ppt; LOPC Classification.pdf; GoM LoWC RMP Update 03.10.2009.pdf; Dropped Objects Risk Strategy.ZIP

FYI - clutter I mentioned this afternoon.

From: Fritchie, Glenn D
Sent: Wednesday, June 03, 2009 2:58 PM
To: Lovely, Andrew; Hiatt, Brian C.
Cc: Sprague, Jonathan D; Rich, David A; Tink, Steve; Jassal, Kal; Porter, David A; Jackson, Curtis W (HSSE); Kirton, Bill
Subject: FW: Process Safety Lessons for Mad Dog Consideration - June 3rd Meeting: Agenda and Pre-Read
Importance: High

Andrew, Brian, All,

The note below summarizes what I was able to learn in a couple of hours yesterday. Thanks to Curtis, Kal, and Dave for the impromptu call and feedback. I have a note in to Steve Tink to see if there's someone in the D&C HSE organization better able to articulate what we do in the matter of Process & Design safety, lessons learned, and assurance than I can.

Have also cc'd Jon and Dave, who are our D and C Engineering Authorities. I honestly don't understand the linkage btwn Brian's role as the EA in the Project, and Jon and Dave's role as EA's in the function when it comes to responsibilities. I know that Jon and Dave are accountable for assuring that D&C ETP's and policy are adhered to, which may suffice Brian's need to assure the AGM/PGM that the D&C portion of process & design safety is being managed. Any clarifying comments here are greatly appreciated. The basic quest here is to provide assurance to the Project that Process & Design safety is being managed in all disciplines --- which is Andrew's role as Miocene Program Process Safety & Risk Engineer.

The meeting has been postponed, which gives me a bit of space to try and tie these pieces together to get the right people engaged to support the project.

Thx

From: Fritchie, Glenn D
Sent: Tuesday, June 02, 2009 6:01 PM
To: Waligura, Jason (AEA, LP); Plott, Ronald S; Andrea, Mark D (Hamilton); Richey, John F.; Dickerson, Gregg (LEWCO)
Cc: Kirton, Bill; Sprague, Jonathan D; Driscoll, Pete; Rich, David A; Miglicco, Terry P; Jassal, Kal; Porter, David A; Jackson, Curtis W (HSSE); Wulf, Gary T; Schilling, David A; Kendall, Alan (Frontline Group)
Subject: RE: Process Safety Lessons for Mad Dog Consideration - June 3rd Meeting: Agenda and Pre-Read
Importance: High
Folks,

EXHIBIT #	786
WIT:	

Have been on phone with Dave Porter, Kal Jassal and Curtis Jackson to try and understand what's going on in the world of Process Safety, IM, and Risk Management in the GoM SPU D&C in preparation for above captioned meeting.

Here's what I heard, some of which may be old news to you:

1. Process Safety in D&C has been defined. See material below that discusses "Process Safety" as it relates to D&C. The HIPO incidents in the earlier email from our Process Safety and Risk Engineer (dropped objects, dragging a BOP, falls, etc) probably do not fall under D&C Process Safety. The PDF is a guidance document on the Loss of Primary Containment -- definitions of what it is, is not, and contains severity categories.

<<...>> <<...>>

2. Have also learned that we do not have a standard action plan for S&OI risks. The intent is for mitigation plans to be developed by project so that the unique features & risks of each project are addressed in SIMOP's plans, rig move plans, lifting plans, etc. S&OI risks are identified in HAZID's/HAZOP's driven by the project (D&C supports and participates, but does not schedule and drive these events)

3. D&C has 4 Major Accident Risks (MAR risks) -- 3 of which are due to loss of well control. The 4th is related to Dropped Objects. We have a standard risk management plan for loss of well control.

<<...>>

4. Regarding Dropped Objects - Kal Jassal put together the attached risk mitigation plan which shows the three risk management plans that are currently being used to manage dropped objects in the GoM. He also indicated that work was underway to modify STP GoM GP 78-29-1 to an ETP so that each project had addressed the elements therein. We intentionally do not want a standard "one size fits all" plan and need the flexibility for each project to address its unique dropped object risks. (example given: Thunderhorse and a single well tieback do not have the same risks, or need the same plan). This is consistent with #2 above. It is the responsibility of the Project Risk Engineer to deliver the Dropped Object Risk Management Strategy as this will be a multidisciplined effort that D&C will support. We need to understand timing and how to support this with our D&C resources (Select/Define?? Engineering/Ops??)

<<...>>

Jason, why don't you stand by tomorrow and let me see where this is all headed. Am now thinking I need to learn some more about the intent of this effort so I know who to engage. Kal, Dave, will circle back around when I know more and set a meeting with the right folks to address the need.

Please clarify and add your comments as needed.

Thanks

From: Fritchie, Glenn D

Sent: Tuesday, June 02, 2009 3:09 PM

To: Waligura, Jason (AEA, LP); Plott, Ronald S; Andrea, Mark D (Hamilton)

Cc: Driscoll, Pete

Subject: FW: Process Safety Lessons for Mad Dog Consideration - June 3rd Meeting: Agenda and Pre-Read

Guys,

There's a Process Safety LL meeting tomorrow and you'll see a section for D&C to discuss the HIPO's on the shared drive at the location below.

It starts at 2:30 and was wondering if one of you is available to attend. Looks like its more ops focused, so will leave it to you -- in fact, it would be great if more than one wants to attend to support us -- even if just for the drilling piece.

Thx

From: Valot, Wendy C (Turner & Townsend Energy)

Sent: Friday, May 29, 2009 8:37 AM

To: Hiatt, Brian C.; Smith, Kristin L; Thyssen, Terri; Strachan, Alistair D; Adams, Gary P; Littlefield, S. Burt; Stein, Norine A; Fritchie, Glenn D

Cc: Carter, Donnie J; Lovely, Andrew

Subject: RE: Process Safety Lessons for Mad Dog Consideration - June 3rd Meeting: Agenda and Pre-Read

All,

In preparation for next week's meeting, Andrew & I wanted to communicate the:

- Meeting objectives
- Agenda
- Pre-read

The meeting objectives and agenda can be seen on the attached file.

<< File: Process Safety Agenda -June 3rd.doc >>

The pre-read, then, addresses the portion of the meeting where we will discuss the incident related lessons that Andrew has identified by discipline. We ask that Terri, Alistair and Glenn go out and look at those lessons specific to their discipline; Andrew has placed them in 3 separate subdirectories on the shared drive. In addition, all the meeting participants would benefit from at least reading a few of those incident-related lessons in preparation for that portion of our meeting discussion. See the link below:

< file://\Bp1houis011\group\GOM_DW\Developments\Miocene\Program\EA_EM\Design_Safety\Miocene Learning Lessons\MIA & HiPo Process Safety Lessons Learned\>

The intent of having these incident-related lessons as a pre-read is so that the discussion in the meeting is not so much about specific content of those lessons, but -- instead -- how the team will apply learnings from incident-related lessons going forward. As the agenda shows, the intent is for Terri, Alistair & Glenn to join in leading this portion of the meeting to aid in determining common expectations and a common process.

If you have any questions about the meeting, please feel free to contact me or Andrew.

Donnie - We know that you will be out of the office & will not be attending this meeting. Andrew & I will bring you up to date when you return.

Regards,

Wendy

GoM KM Authority

X 8469

Subject: Process Safety Related Federal and GoM SPU Lessons for Mad Dog Consideration

When: Wednesday, June 03, 2009 2:30 PM-4:30 PM (GMT-06:00) Central Time (US & Canada).

Where: WL 4 745

From: Lovely, Andrew

Sent: Thursday, April 02, 2009 1:28 PM

When: Thursday, May 28, 2009 2:00 PM-4:00 PM (GMT-06:00) Central Time (US & Canada).

Where: WL4 762

Thanks

Andrew

Intent is to gather key Mad Dog subsea tieback project leads and others with a process safety technical stake to review 83 Federal/GoM SPU lessons filtered from the 1400+ available to:

- confirm or reject their applicability;
- accept an action to implement the lesson if confirmed as applicable; and
- describe what the project will do to implement the learning and over what timeframe.

As all the entries have an S&OI theme the workshop action agreements and actionees can be entered and tracked via our project S&OI tracker. I would not expect this gathering to take more than a couple of hours.

The workshop will be facilitated by Wendy Valot as our Knowledge Management tag.

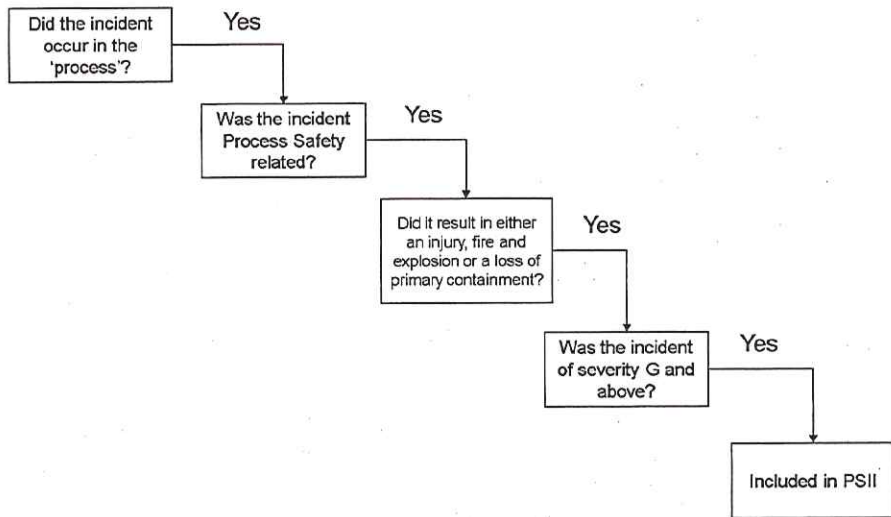
By doing this we can take credit for a visible and auditable process for learning lessons as required by our Knowledge Management Plan, our Mad Dog HMP and implicitly expected in the MPcp HSSE Guidelines and Knowledge Management Guidelines.

Wendy and I will confirm details later.

Regards

Andrew

The basics of the Process Safety Incident Index (PSII)



So what is 'the process'?



- Wells (Wellhead, Xmas tree etc)
- Flowlines (including flanges, pig launchers/receivers and valves)
- Manifolds
- Separators (and other pressure vessels)
- Processing
- Gas Compression and turbines
- Metering
- Drains
- Vent and Flare systems
- Export / import pipelines
- Pumps
- Storage tanks
- Drilling / workover circulation system (see next slide)

What is the drilling 'process'?



- Mud pits
- Mud pumps
- General circulation system pipe work
- Mud/gas separator
- Shakers
- Cement storage pits
- Cement pumps
- Cement pipework
- Well bore (drill string, casing, conductors and BOP)
- High pressure utilities associated with above equipment

Which fires and explosions should be included?



- All fires and explosions - no matter how small - must be reported into Traction.
- However, only process safety F&E will make it into the PSII.
- They must also have an **actual severity level** marked under **equipment damage** to be included.
- When the incident causes no damage with a direct financial cost, level H should be selected in the matrix i.e. equipment damage < \$25k.

What about Environmental Events?



- Currently, environmental violations / non-compliances that are PS related are included in the PSII.
- The plan is to change this as it is inconsistent with the basics of the metric.
- The plan is, if a material release has had an environmental impact then this will be picked up from the **actual** severity matrix under the **environment** column.

What is meant by 'Energy'?



- In the current definition of process safety, it includes "An unplanned event or occurrence which has, or could have, released hazardous materials or energy".
- This is being interpreted very broadly
- Guidance is now that this just means;
 - Overpressure (including steam) or
 - Detonation or Deflagration
 - Electrical arcs or other releases of electrical energy that causes injury or property damage.

Are there any examples of Process Safety related incidents?

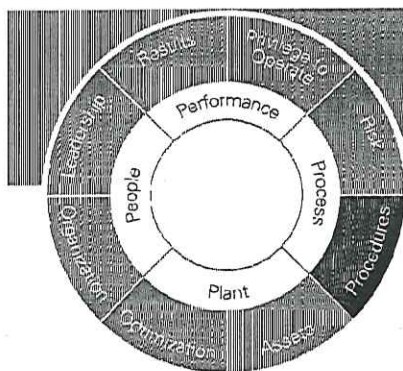


- Unplanned release of flammable, combustible, or hazardous fluids from the process plant (this would include loss from flare stack if the process did not operate within its normal design criteria i.e. liquid drop out).
- Any fire or explosion resulting from an unplanned release of flammable, combustible, or hazardous from the process plant or pipelines.
- Injuries or Fatalities resulting from either of the above.
- Diesel release from storage / transfer / supply system
- Hazardous chemical release from storage / transfer / supply system
- Any loss of hazardous fluid or gas (including muds, if hazardous) from the drilling 'process'.
- Kick or blow out at drilling location
- Electrical arc that causes and injury to an individual within the process boundary

Are there any examples of non-Process Safety incidents?



- Marine transport vessel incidents, except when the vessel is connected to the facility for the purposes of crude or product transfer
- Truck and/or rail incidents, except when the truck or rail car is connected to the facility for the purposes of crude or product transfer
- Routine emissions that are allowable under permit or regulation
- Releases to a properly designed and operating emissions control device, such as a flare, scrubber or relief device
- Office building incidents (e.g., office heating equipment explosions, fires, spills, releases, personnel injury or illness, etc.);
- Planned and controlled drainage of material to collection or drain system designed for such service
- Mechanical work being conducted outside of process units or in maintenance shops
- Dropped objects
- Injuries resulting from slips / trips / falls, lifting, movement around the plant, falls from height
- Radiation release



Guidance for Identification of Process Safety Related Incidents

NOTE: Refer to "GoM Incident Notification, Reporting and Investigation Procedure" - CD # UPS-US-SW-GOM-HSE-DOC-00115-2, which can be found in Chapter 20 of the GoM Safe Practices Manual on the HSSE website or in Sub-Element 4.4 using the OMS Navigator.

A Process Safety Incident Requires:

- Loss of primary containment (LOPC) of combustible, flammable, or toxic production chemicals from process equipment or storage. (See Table 1). OR
- Fire, explosion, unintended electrical arc in the process area OR
- Overpressure of equipment outside design pressure limits

Table 1

LOPC Is Process Safety Related	LOPC Is Not Process Safety Related
Produced fluids¹: <ul style="list-style-type: none"> ■ Crude Oil and Natural Gas 	Produced fluids: <ul style="list-style-type: none"> ■ Water
Flammable and combustible materials¹: <ul style="list-style-type: none"> ■ Methanol ■ Diesel ■ Corrosion Inhibitors ■ Asphaltene Inhibitors ■ Defoamers ■ Scale Inhibitors ■ Glycol ■ Xylene ■ Paraffin Inhibitors ■ Demulsifiers ■ Hydrate Inhibitors 	Flammable and combustible materials: <ul style="list-style-type: none"> ■ Aviation Fuel
Toxic non flammable or combustible chemicals²: <ul style="list-style-type: none"> ■ Nitrogen ■ O₂ Scavengers ■ Biocides ■ Acid 	Other production chemicals: <ul style="list-style-type: none"> ■ Water Clarifiers ■ Reverse Demulsifiers
Non-process related fluids: <ul style="list-style-type: none"> ■ Lube Oil ■ Heat Media Fluid 	Non-process related fluids: <ul style="list-style-type: none"> ■ Hydraulic Oil ■ Potable Water

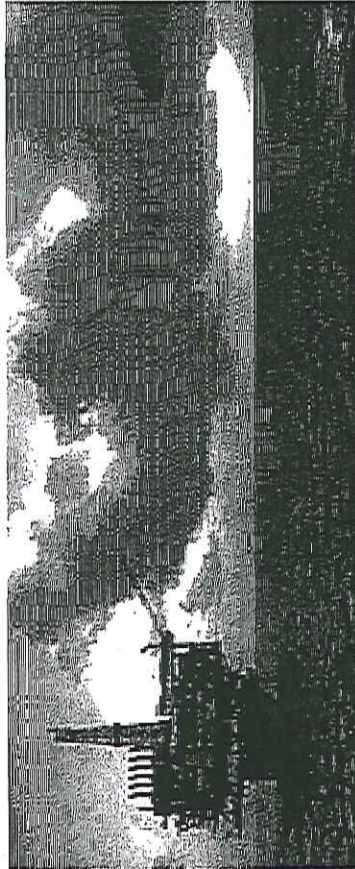
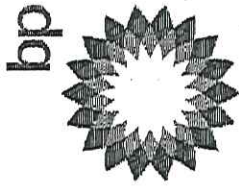
¹ Use table 2 to determine LOPC severity.

² Contact the GoM Industrial Hygienist to determine LOPC severity.

Refer to Process Safety Engineers for materials not listed in Table 1.

Table 2

Severity Category	A - D	E	F	G	H
Safety Incident	3+ Fatalities	1 to 2 Fatalities	DAFWC	Recordable	1st Aid
Equipment Damage	> 100 m\$	5m to 100m\$	500k to 5m\$	50k to 500k\$	< 50k\$
LOPC (Gas)	> 200 mscf	20 to 200 mscf	2 to 20 mscf	0.2 to 2 mscf	< 0.2 mscf
LOPC (Flammable)	>100 bbl	10 to 100 bbl	1 to 10 bbl	0.1 to 1.0 bbl	< 0.1 bbl
LOPC (Combustible)	>1000 bbl	100 to 1000 bbl	1 to 100 bbl	0.1 to 1.0 bbl	< 0.1 bbl



Update for GoM Risk Mitigation Plan -- LoWC

David Porter March 10, 2009

Integrity Management
Reducing Risk in GoM

Risk Mitigation Plan

Description of Risk Uncontrolled flow of hydrocarbon energy during completion or well intervention activities. The potential for a fatal well control event, which could result in a major release of hydrocarbon gas, is reduced by the implementation of a well control plan. This plan applies to all levels 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 81

- Built to address the LoWC major risk during all rig operations for the BP-owned rigs on Holstein, Mad Dog, and Thunder Horse
- Also applicable to contractor-owned MODUs in the SPU
- Includes drilling, completion, and well intervention activities

Integrity Management

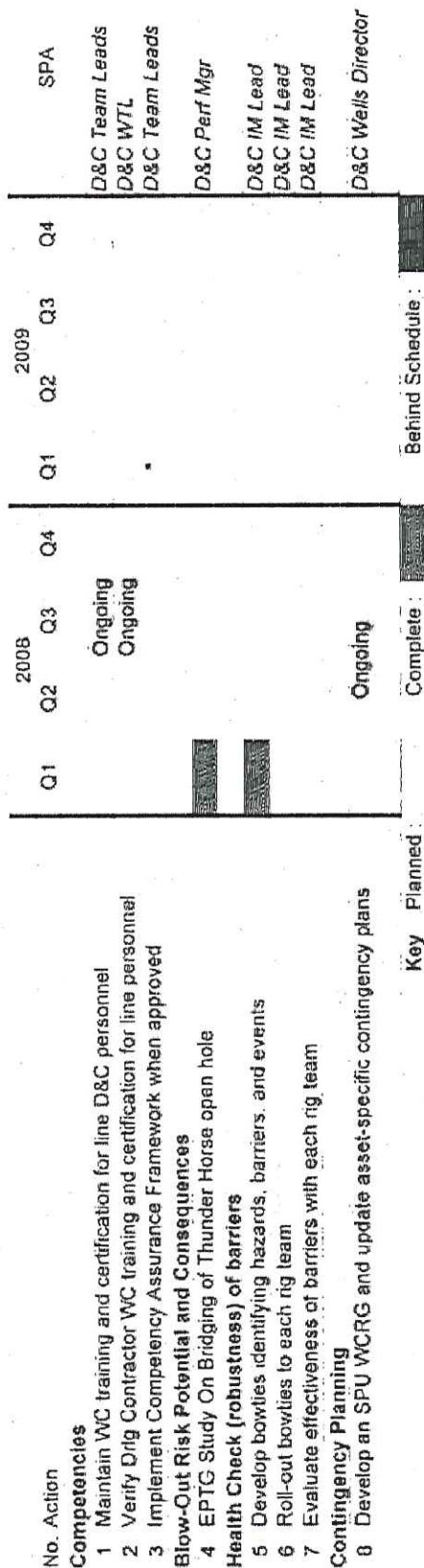
Specific Actions and SPAs



Description

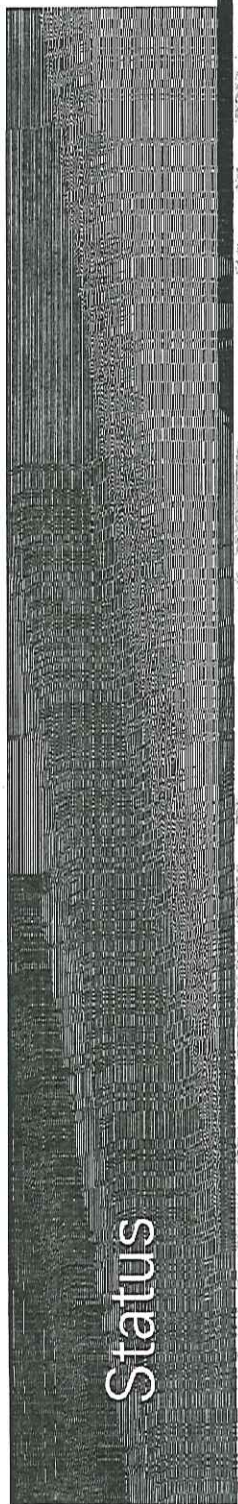
The risk mitigation plan will focus on key tasks and schedule for evaluating competencies (People), well control equipment condition (Plant), and procedures (Processes) used to control the loss of well control risk. These tasks include:

- 1 - Revalidate and maintain Well Control (WC) training and certification for all line D&C personnel (BP & Contractor).
- 2 - Follow Segment forward plan to implement a Competency Assurance Framework for D&C when rolled out late in 2008.
- 3 - Review and assure the health/robustness and effectiveness of the barriers and controls identified in the bow-ties for the loss of well control risk.
- 4 - Roll-out the BowTies to each rig.
- 5 - Develop an SPU Well Control Response Guide (WCRG) and update asset-specific Contingency Plans



Notes:

- SPU submitted a temporary deviation for Element 2 Competencies until YE 2009 requesting the Segment provide Assessor resources for D&C staff. Training and assessments are in a phased Segment-wide plan beginning with WSLs first, followed by Sr. Drilling and Completions Engineers, and Wells & Engineering Team Leaders (including Consultants working in these roles on BP's behalf).



Status



1. Revalidate and maintain Well Control (WC) training and certification for all line D&C personnel (BP & Contractor).
 - ✓ Each D&C Team Leader accountable for their own operations; training records validated by Subpart O internal audit.
 - ✓ D&C HSE Advisors are auditing WC training records for Drlg Contractor personnel on 6 month cycle.
 - ✓ Pride is implementing a Competency Framework for their staff with significant progress.
 - ✓ Named a GoM D&C WC TA (John Shaughnessy).
2. Follow Segment forward plan to implement a Competency Assurance Framework for D&C when rolled out late in 2008.
 - ✓ Sr WSL pilot finished (NAG, GoM)... 1 more pilot possible by end 2Q (N. Africa). Solid Dbase of some 250 questions in place. Also, a strategic 10-yr Plan is being developed for SDE, SCE, SIE to establish baseline competency for all level G globally.
3. Review and assure the health/robustness and effectiveness of the barriers and controls identified in the bow-ties for the loss of well control risk.
 - ✓ Completed robust generic BowTies last year with representative input from all D&C Teams. Discussed BTs with Pride.
 - ✓ GoM Barrier Assessment Tool framed, then used to help steer and develop forthcoming Segment RP.
4. Roll-out the BowTies to each rig.
 - ✓ Building GoM D&C Risk Mgmt Strategy & Process aligned with OMS which includes using BTs along with other tools.
5. Develop an SPU Well Control Response Guide (WCRG) and update asset-specific Contingency Plans
 - ✓ WCRG ~80% complete with expected delivery end-1Q. TH & Holstein specific contingency plans expected end-2Q.