

**Montara Well Incident 21/8/09**

**Actions to Prevent Recurrence, 25/5/10, rev 4. Subject to review / amendment.**

Action	By	Target	Status
<p><b>1. Verify Well Barrier Integrity</b>  <b>Barriers on Montara wells H2, H3-ST1, H4 and GI-ST1 must be verified.</b></p> <p>1.1 Review and confirm status of existing well barriers.                      1.2 Prepare well barrier integrity test procedures / plan.                      1.3 Prepare contingency plans should integrity tests prove inconclusive or negative.                      1.4 Execute well integrity tests offshore.                      1.5 Carry out any remedial work required as per contingency plan.</p>	<p>Initiated by AA Drilling, review / finalised by AGR. BKK Drilling review.</p>	<p>End June 2010</p>	<p>Test plans + regulatory approvals in progress. Plan offshore 18/5/10</p>
<p><b>2. Drilling Management System</b>  <b>Amend Drilling Management System documents (Well Construction Standard, Well Management Framework) to include:</b></p> <p>2.1 Complete and independent review of WCMF, WCS.                      2.2 Clear well barrier policy, implementation and testing.                      2.3 Comparison with PTTEP Corporate requirements and Good Oilfield Practice.                      2.4 Management of Change process including risk assessment and approval outside drilling dept.                      2.5 Ensure Effective application of JSA.                      2.6 Include Hold Points in drilling program for critical activities.                      2.7 Prepare a Cementing Manual.                      2.8 Develop Stand alone WOMP's.                      2.9 Develop Desk Drilling Guide for Drilling Supts.                      2.10 Propose Drilling Program improvements.                      For details of all actions relating to the Drilling Management System see Appendix 1 below.</p>	<p>AGR  BKK Drilling review.</p>	<p>Drafts end June 2010, final end July 2010</p>	<p>In progress.</p>
<p><b>3. Contracts</b></p> <p>3.1 Insert a requirement in contracts that any reports they prepare on work done must be sent to PTTEP AA on / offshore.</p> <p>3.2 Review contracts to make sure there is a requirement for third party personnel to have required training as set out in training matrices which are similar to PTTEP AA operating discipline</p>	<p>AA Drilling</p>	<p>Before next drilling campaign. April 2011</p>	<p>To be done.</p>

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standards.			
<p><b>4. Investigations</b></p> <p>4.1 Update PTTEP AA investigation protocols to require PTTEP Corporate or independent expert to undertake a review of any well control incidents. Reference: Corporate SSHE Standard Incident Management.</p>	AA HSE	End June 2010	To be done
<p><b>5. Lobby Industry</b></p> <p>5.1 Lobby industry groups to approach NOPSA to develop a policy which requires collaborative engagement and consultation during an emergency.</p>	AA CEO + COO	Initiate June 2010	Next APPEA meeting
<p><b>6. Pre-Drilling Scoping</b></p> <p>6.1 Obtain knowledge of other rigs working in the region and their capacity / suitability to conduct a relief well operation before commencing drilling.</p>	AA Drilling	Before next drilling campaign, April 2011	To be done
<p><b>7. Organisation and Personnel</b></p> <p>7.1 Demobilise (or temporarily assign to ensure knowledge continuity) contracted drilling personnel from Perth office and replace with competent staff employees.</p> <p>7.2 Undertake a review of the complete organization of PTTEP AA. Make recommendations and implement changes required including personnel.</p>	AA COO	End June 2010 (Demobilise)	In progress
<p><b>8. Training and Competence</b></p> <p>8.1 Review and improve technical and SSHE training matrices for Drilling and other personnel (Operations, HSE, Construction etc).</p> <p>8.2 Identify and provide training courses required.</p> <p>8.3 Develop technical and SSHE competency matrices for Drilling personnel (and extend to Operations, SHE, Construction etc). Reference: Corporate SSHE Standard Training and Competence.</p> <p>8.4 Undertake competency assessments. Note: involve relevant disciplines from PTTEP HQ in this activity.</p>	HRS, CSH, BKK Drilling, PTTEP AA personnel	Before next drilling campaign, April 2011.	To be done.

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8.5 Provide training etc to fill gaps identified by competency assessments. 8.6 Engage with training providers to broaden Well Control course scope.	AA	July 2010	To be done
<b>9. Corporate Oversight</b>			
9.1 Develop Working Relations document to identify Corporate – subsidiary responsibilities and working relations. Covers all disciplines / work activities.	INA	December 2010	In progress
9.2 Develop plan of Corporate technical and management system audits. Reference: Corporate SSHE Standard Audit and Review; Operations and Project Technical Review Procedures.	CSH, BKK Drilling	Plan end June 2010, execute audits later	To be done
<b>10. Implementation</b>			
10.1 Establish a senior management committee to oversee implementation of actions in this plan. Members from PTTEP HQ and PTTEP AA.	CEO + AA CEO	End June 2010	To be done
10.2 Appoint a Coordinator to ensure actions in this plan are implemented in agreed timeframes and actions are made sustainable.	AA CEO	End June 2010	To be done

**Appendix 1 – Specific Actions Under Drilling Management System**

Action	By	Target	Status
<p><b>Drilling Management System</b>  <b>Amend Drilling reference documents (Well Construction Standard, Well Management Framework) to include:</b></p> <ol style="list-style-type: none"> <li>1. Review Well Construction Standards and development drilling programs to assess opportunities for technical improvement.</li> <li>2. Refer to need for peer reviews of final well design.</li> <li>3. Refer to Drill the Well on Paper session to be held to inform service providers.</li> <li>4. Align PTTEP AA drilling documents with PTTEP Corporate Drilling Management System</li> <li>5. Additional information on well barrier policy and implementation when MODU is not in place.</li> <li>6. Drilling Supervisors to review JSA's and be aware of content.</li> <li>7. Ensure Rig Contractor applies and monitors JSA performance.</li> <li>8. Undertake compliance (by PTTEP AA HSE) and technical integrity reviews (by PTTEP Corporate).</li> <li>9. Include authorities, responsibilities and accountabilities for each drilling job.</li> <li>10. Include current logistics and materials management processes.</li> <li>11. Attendance of third party contractors at HAZIDS is compulsory.</li> <li>12. Ensure Safety Case submission standards do not drop.</li> <li>13. Review rig operators SMS to ensure effective JSA is in place and that it covers third party work on the rig.</li> <li>14. Requirement that daily work instructions issued by Driller are Signed Off by Senior Toolpusher or OIM.</li> <li>15. Drilling Supervisors sign off any Operational management of Change requests.</li> <li>16. Daily conference call is held attended by core operations team on rig, in Darwin and Perth.</li> <li>17. Third party audit is undertaken of safety critical components of Well Construction management System such as Management of Change.</li> <li>18. Implementation of MODU facility Safety Case revision requirements interfaces with PTTEP AA</li> <li>19. Drilling Program and Well Operations Management Plan.</li> <li>20. Periodic audits held of Rig Contractors JHA process.</li> <li>21. Documenting of reasons for selecting Drilling Supervisors and benchmark skills against responsibilities. Ensure further reference for each person employed is sourced.</li> </ol>	<p>See item 2 above</p>		

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<p>22. Include Frontline Safety Leadership for training for Drilling Supervisors.</p> <p>23. Ensure Materials and Logistics Supervisors have been trained and understand work processes.</p> <p>24. Induct Drilling Supervisors into WCMS before operations start.</p> <p>25. Handover notes to be sent to Drilling Superintendent as well as oncoming Drilling Supervisor the night before shift changeover. 1 hour long call to take place day before change over and short face-to-face meeting on rig.</p> <p>26. Ensure Rig Contractors have effective tracking system for Safety Observation Programs.</p> <p>27. Drilling Supervisors to be trained in PTTEP AA HSE, hazard identification, well control.</p> <p>28. As part of Management of Change process ensure each hazard is identified and Drilling</p> <p>29. Superintendent and Offshore each have opportunity to sign off on final risk assessment and mitigations, and that this is checked during audits. Reference: Corporate SSHE Standard Management of Change.</p> <p>30. Ensure ongoing risk management is done and this is audited.</p> <p>31. Review drilling training matrix to cover third party and rig equipment. Review and update annually. Reference: Corporate SSHE Standard Training and Competence.</p> <p>32. Develop more detailed training matrix that identifies courses or experience requirements to each well of well construction personnel.</p> <p>33. Develop minimum training matrices for major contractors eg Rig Operators, Cementers.</p> <p>34. Develop an Operating Discipline Standard for supervisors.</p> <p>35. Set clear expectations regarding importance and effectiveness of supervision / oversight at rig site.</p> <p>36. Ensure manufacturer's instructions are received and available on site.</p> <p>37. As built diagrams containing serial numbers of all components are provided on job completion.</p> <p>38. Review communications processes and suggest improvements.</p> <p>39. Ensure Drilling Superintendent and Drilling Engineer cross check that the work being reported as having been done in the DDR and IADC is what is said was done and any changes are properly assessed by Management of Change process.</p> <p>40. Include hold points in Drilling Program where work must cease until it has been signed off by the Drilling Superintendent and the OIM that a critical activity has been undertaken.</p> <p>41. Regular technical drilling audits occur during drilling campaign.</p> <p>42. Competency Matrix is developed for Drilling Manager, Drilling Superintendent, Drilling Engineer and Drilling Supervisors. Reference: Corporate Competency Management System (HRS), Corporate SSHE Standard Training and Competence.</p> <p>43. Persons employed for above roles are engaged in accordance with Competency Matrix.</p>			

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<p>Infield verification of competency prior to undertaking role unsupervised the first time. This may be waived if person has worked for PTTEP AA before and Drilling Manager and COO agree. PTTEP Corporate to assist with performing competency assessments.</p> <p>44. Requirement to comply with Drilling Program is included in Drilling Supervisors Job Description.</p> <p>45. Need to comply with JSA and MoC is included at inductions and on Drilling Supervisors course.</p> <p>46. Audit program to include checks that JSA and MoC procedures are being complied with.</p> <p>47. Include in JSA training examples of what constitutes safe work, Good Oilfield Practice.</p> <p>48. Audits to be conducted for JSA's for all critical tasks and SimOps.</p> <p>49. A materials list for al significant well control steps is available.</p> <p>50. Production logistics system will apply to drilling.</p> <p>51. Requirement for 2 proven well barriers to be included.</p> <p>52. Review updated WCMS documents by third party or PTTEP Corporate.</p> <p>53. Schedule periodic project management audits.</p> <p>54. PTTEP Corporate to review roles, responsibilities and accountabilities for PTTEP AA CEO, HSE Drilling Team and Project Team.</p> <p>55. Update Job Descriptions based on above review.</p> <p>56. Any change in well control barriers is fully risk assessed and is submitted with MoC documents to the Regulator with the application to change approval.</p> <p>57. Hold pre-spud meeting for each swing shift during which well design and reasoning are explained.</p> <p>58. Develop Drilling Program based on manufacturer's instructions for installation of any parts such that detailed use is described and there is no need to refer to manufacturers instructions later.</p> <p>59. Clearly identify requirements with respect to cementing well and if appropriate for the design and use of lead / tail cement.</p> <p>60. Drilling to undertake handovers using Operations methodology.</p> <p>61. Documented records are kept of teleconferences between onshore / offshore.</p> <p>62. Barrier certifications are provided to Drilling Superintendent and Drilling Engineer for review.</p> <p>63. Day to Day Instructions to Drillers are copied to the Drilling Superintendent, Drilling Manager, and Drilling Engineer.</p> <p>64. Detailed minutes of any hazid are kept.</p> <p>65. All staff technical drilling personnel are required to undertake 20 hours of continuing professional development per year.</p> <p>66. Contractors required to ensure management personnel have undergone a program similar to PTTEP and are required to work to work to PTTEP discipline operating standard.</p>			

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67. Document the need for a repeat pressure test if the plugs do not bump or de-bump. 68. Address a failure of floats during the course of cementing. 69. Identify the relevance of other documents to well control e.g. contractors operations manual. 70. Drilling and suspension of wells at a platform prior to topsides installation. 71. Well control during batched tieback of casing strings on different wells. 72. Develop WOMP's so that they are stand alone documents and there is no need to refer to any other document when reading it and that they include manufacturer's instructions 73. Review formatting of documents associated with the Management System 74. Develop a new desk guide for Drilling Supervisors. 75. Develop a Cementing Manual which covers the cementing process, what can go wrong and what to do in the event of failure.			

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