

**Appendix 25**  
**Indicated vs. True Level in Raffinate Splitter**



## **Indicated vs. True Level in Raffinate Splitter Bottoms**

Note: The following is e-mail message from Mike Moosemiller at BakerRisk:

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A question was raised as to what the true level in the splitter bottoms would be for an indicated level of 50% on the level instrument L5100. If the column had been established at a 50% level when cold (as per Step G.16 of the startup procedure), and maintained at the 50% level reading as the column heated up, the actual level would have been higher in proportion to the drop in liquid density.

The L5100 readings ranged from ~ 100% when cold to ~ 78% when hot. Thus the true level at a 50% reading, when hot, would have been about  $50\% \times (100\%/78\%) = 64\%$ . That is, the true liquid level would have remained within the range of the instrument taps, and thus level control should have been maintained for a device set in automatic mode.

MM 7/20/05  
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**Appendix 26**  
**Summary of MOCs Related to the ISOM Incident**



## Summary of MOCs Related to the ISOM Incident

During the course of the March 23, 2005 ISOM Incident Investigation a number of Management of Change (MOC) Forms were reviewed to identify any which might be related to the cause(s) of the incident and/or which indicate potential failures in the management system. The site has established a detailed process for managing MOCs. The system includes specific procedures, a number of specific checklist for evaluating change, a database for managing actions, training, defined responsibilities, and specific definitions to assist the user to understand what constitutes “change.”

The MOCs that were reviewed during the course of this investigation fall into four categories:

- Temporarily occupied buildings
- Process
- Relief systems
- Organizational

MOCs reviewed during the course of the investigation include:

MOC #	Description	MOC Type	Status	Comments
MOC-NDU-2004-008	Merit trailer for Motorization Project on Ultracracker sited between NDU and ISOM	Occupied Building	Approved to Proceed-- NDU trailer sited without MOC having the Superintendent's approval to commission, as required by SH-PSM-10.	
MOC-ULC-2005-001	MOC to install 9 trailers for ULC Turnaround	Occupied Building	Commissioned	
MOC-PWR2/OS U-2001-022	Fluor construction trailer temporarily sited at catalyst warehouse during NDU Construction.	Occupied Building	Commissioned	
MOC-ISOM-2003-030	The ISOM Shelter is currently listed as a secured facility in S-12, but no longer meets the requirements and needs to be removed from the list.	Occupied Buildings	Cancelled— Unable to arrange meeting to complete MOC.	PHA completed Review PHA
None	Moving in a temporary staff trailer	Occupied Building	Initiated	
R-ISOM-98-09	Operate E-1101 with a flooded drum	Process	Commissioned	Action item to train Operators and update Procedures assigned and completed by David Breedlove  PSSR not required per site policy (SH-PSM-7) since action items for chance only involved one equipment category, instrumentation.

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MOC #	Description	MOC Type	Status	Comments
MOC-ISOM-2000-002 (Operations cancelled)	E-1101 control change	Process	Cancelled	
MOC-ISOM-2002-023	Add a piping tie-in on existing NDU Flare Header for future ISOM maintenance drum connection as part of Clean Streams Project	Relief System	Cancelled	
MOC-ISOM-2002-026	Install wet and dry maintenance drum	Relief system	Cancelled— Project delayed	Initiated as a result of Clean Stream Project. Although MOC-ISOM-2002-026 to install wet and dry maintenance drums was cancelled, the tie-ins were installed in preparation for that project under this MOC.
MOC-ISOM-2003-005	Derate E-1101 from 75 psig to 40 psig	Process	Commissioned	Formal PSSR should have been completed since the action items required by the change impacted both instrumentation and the relief system. The change was also done during a turnaround. The de-rating was completed during the Jan/Feb 2003 during TAR.  Logan closed out Section III item to update operating procedures. The Startup Procedures in use at the time of the incident were not updated with the new relief valve settings. The Investigation Team found no evidence that the operating procedures were updated to reflect this change.  PSSR not in PSM Dept's file. PSSR not found in unit records.  The Asset Operations Superintendent is responsible for initiating a PSSR.
MOC-ISOM-2003-004-001	Derate E-1101 from 75 psig to 30 psi	Process	Cancelled	
MOC-ISOM-2000-005	Install temporary blow down pump out pump	Process	Commissioned	Formal PSSR not required
MOC: ISOM 2004-007	Temporary Leak Repair Authorization to Install Clamp on Flange of Thermowell 5619	Process	Commissioned	Formal PSSR not required
MOC-ISOM-2004-008	Temporary Leak Repair Authorization to Install Clamp on 5116 Sample Point Valve just off 4-O-408	Process	Commissioned	Formal PSSR not required
MOC-ISOM-2005-002	Decommissioned/Demolished F1101A, wo#3003057254; ISOM 2005 outage.	Process		Formal PSSR not required

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MOC #	Description	MOC Type	Status	Comments
MOC: ISOM 2004-002	Temporary Leak Repair Authorization to Install Clamp on Flange of Line 4-SC-4901-61 @ LCV 430 Bypass	Process	Commissioned	Formal PSSR not required
MOC: ISOM 2004-004	Temporary Leak Repair Authorization to Drill and Tap Valve Packing and Valve Threads to Reduce FE	Process	Commissioned	Formal PSSR not required
MOC: ISOM 2004-010	Temporary Leak Repair Authorization to Drill and Tap Control Valve Packing FE Leakers	Process	Commissioned	Formal PSSR not required
MOC: ISOM 2004-005	Temporary Leak Repair Authorization, Division: West Plant, Facility: Isom; MOC Supplemental Requirements Checklist for Drill & Tap Valve Packing & Valve Threads for J-19 pump 12" suction valve	Process	Commissioned	Formal PSSR not required
MOC: ISOM 2004-004	Temporary Leak Repair Authorization for C-50C bonnet bleed valve packing	Process	Commissioned	Formal PSSR not required
MOC- ISOM- 1999-006- 001	Consolidation of the ISOM & AU2 optimization operator positions,	Organization		Action item not done. Action item was to..."With consolidation of the ISOM & AU2 optimization operator positions, consider repositioning the ISOM active alarm display to provide better visibility to the board operator." Action not completed due to project economics. Action would require \$20M/workstation to mitigate.
MOC-NDU- 2001-002	Combine NDU Board Operator responsibilities with the AU2/ISOM Board Operator responsibilities	Organization	Commissioned	<p>All action items were completed by April 30, 2003; 004-Advise the project team that the existing ISOM cameras unreliable; 006-Develop a simulator for the AU2/ISOM/NDU control board operator position, or in the alternative developing effective gun drills. Resolution—Gun Drill Program has been developed as required.; 010-Develop a training plan for the AU2/ISOM/NDU control board operator position in accordance with SH-PSM-5, Training for Process Safety. Resolution—Added the NDU training requirements to the ARU/AU2/ISOM training matrix; 012- Extend the requirement to have two control board operators for any planned startup or planned shutdown activities to include the NDU.</p> <p>Recommendation 018-Consider establishing/reinforcing the management philosophy relative to managing unit upsets versus initiating a safe-off.</p> <p>The MOC was commissioned, which means that all safety and environmental action had been completed. The above action item was a safety action item. The MOC superseded the staffing study, since the staffing study was done prior to the NDU construction.</p>

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MOC #	Description	MOC Type	Status	Comments
MOC-AU2-2001-006	Reduce asset operator minimum staffing from two to one	Organization	Commissioned	
MOC-NDU-2001-003	Combine NDU outside operator responsibilities with the ISOM outside operator responsibilities	Organization	Cancelled—Due to operator workload and lack of automation on the ISOM.	
MOC-ISOM-2001-012	Make changes necessary to eliminate the requirement that an asset Supervisor or designee be on duty around the clock at the AU2/ISOM/ARU complex	Organization	Cancelled—Per Mark Risinger (Asset Superintendent) -"The unit will not pursue this change."	
MOC-NDU-2002-003	Add NDU operating responsibilities to ARU/AU2/ISOM asset Supervisor and west plant optimization supervisor	Organization	Commissioned	001-Simultaneous scheduled startups or shutdowns will not be permitted without having additional supervisory staff on hand.
MOC-NDU-2003-014	Add/Transition NDU Superintendent responsibilities to those of the AU2/ARU/ISOM Superintendent	Organization	Commissioned	

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