

ABERDEEN PSM AUDIT

WORKSHEETS FOR FIELD VERIFICATION

COMPLIANCE AUDIT GUIDELINES SECTION 4.3 PROCESS SAFETY INFORMATION § 29 CFR 1910.119(d)			
7. Are updated P&IDs available?			
a) Are official hard-copies or reliable electronic copies of P&IDs readily available for employees?			
Spot Check Items	Yes	No	Comments
	x		
b) Field check one P&ID from each covered process area by walking the P&ID with the help of a process engineer and an electrical / instrumentation engineer. When a major error or several minor errors are found on the P&ID, the check of that drawing will be considered to be complete and that drawing will be assumed to be inaccurate.			
Spot Check Items	Yes	No	Comments
OM-0914-PID-D RX-500		x	5 minor and one major error found
NM-090112-PID-D Recovered VCM Condenser		x	5 minor errors. EX-101 shown on dwg. but was not found in the field (major error).
OM-090109-PID-D Recovery Compressors & Vacuum Pumps		x	5 minor errors
VS-090101-PID-D VCM Tank Car Unloading	x		
VS-090104-PID-D VCM Yard Equipment		x	2 minor & 1 major error found

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April 18, 1995

Field Verification

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Audit item	Yes	No	Comments	Initials
v) Corrosivity data;	x		Technical references."	DCS
vi) Thermal and chemical stability data; and	x		Technical references.	DCS
vii) Hazardous effects of inadvertent mixing of different materials that could foreseeably occur.		x	No mixing matrix was found for any of the covered chemicals.	DCS
4. Are updated process flow diagrams or block flow diagrams available?		x	Draft PFD's exist for all units. These were not readily available to employees..	DCS
5. Does the plant have documents that describe:				
a) Covered process;	x			DCS
b) process chemistry;	x			DCS
c) maximum intended inventories; and		x	This information was not found.	DCS
d) troubleshooting information.	x			DCS
6a. Does the plant have a compilation of safe upper and lower limits for process parameters?	x			DCS

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DR

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Audit item	Yes	No	Comments	Initials
6b. Does the compilation of safe upper and lower limits include a description of the consequences of deviation?	x			DCS
7. Are updated P&IDs available (also refer to field verification)?	x		Six P&ID's were checked. Four were considered not accurate or up to date.	DCS & CJL
8a. Does the plant have electrical classification for different areas?	x		This was well laid out and identified.	CJL
8b. Does the electrical classification follow NFPA standard or comparable industry standard?	x			CJL
8c. Is the electrical classification indicated on a plot plan?	x			CJL
9a. Is there technical basis for all relief valves (including design information and design basis that follow consensus industry standards and/or considerations made related to fire rating, downstream pressure, reactivity and flow capacity)?		x	Not all relief valves were done(interview comment.) Fourteen relief valves were spot checked. Two were not found (EX-101) For D-500 (PVC Reactor), the calculations were not found, though they are likely to be on file somewhere in the plant.	DCS
9b. Are proper materials of construction used for relief valves?	x		This appears to be the case for the relief valves that were spot checked.	DCS

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D. R.

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Audit item	Yes	No	Comments	Initials
9c. <i>Are relief valves properly designed and installed (this audit item will be verified in field)?</i>		x	Several RV's were considered improperly installed due to lengthy inlet lines, inlet line smaller than the inlet nozzle, and an unlocked block valve upstream of the RV inlet. Refer to the field checks for RV identification.	DCS
9d. Is there technical basis for design of relief headers?	x		Two were spot checked and the technical basis was not found..	DCS
9e. <i>Are flow calculations available for relief headers?</i>	x		Two were spot checked. The flow calculations were available.	DCS
10. Is there technical basis for the design of the ventilation system for all control buildings and process buildings and enclosures (such as design information and design basis that follow consensus industry standards)?		x	Four buildings were checked(sub102, sub 7, sub 4, and the new control room.) No technical basis was found for any building.	DCS
11. Are material and energy balance calculations available for all covered processes built after 5/26/92?	na			DCS
12. Are descriptions of safety systems available for:				

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Audit item	Yes	No	Comments	Initials
a) Fire and gas detection (monitor locations, upper and lower monitor detection limits, detectable gases, etc.);	x			DCS
b) Active fire systems (fire water systems, deluge systems, dry chemical, and mobile or hand-held extinguisher, etc.);		x	No technical description of the fire water system was found, though there is likely one in the plant files.	DCS
c) Passive fire systems (fire walls, dikes, fire protection insulation etc.);		x	No technical basis was found for the VCM sphere containment dike.	DCS
d) Interlocks for process safety systems (description of interlock system, listing of failure modes, logic diagram and/or loop diagram); and	x			DCS
e) Alarms (pressure, temperature, level and flow control systems and alarms)?	x			DCS
<i>Safety systems at a specific site vary. Other safety systems may include:</i>				
<i>Scrubbers;</i>	na			DCS
<i>Emergency generators or UPS;</i>	x			DCS
<i>Flares; and</i>	na			DCS

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D.R.

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Audit item	Yes	No	Comments	Initials
Others:			None were noted.	DCS
13a. Are equipment sheets and/or design files available for all equipment:				
i) U-1 sheets or equivalent for pressure vessels;		x	The equipment files were not complete.	CJL
ii) Specification data sheets for storage tanks;		x	Only a few specification sheets were found for tanks.	CJL
iii) Pump specification sheets;		x	The files were not complete. Spec sheets were missing.	CJL
iv) Compressor specification sheets;	x			CJL
v) Piping specification sheets (line specification referenced on P&ID);	x		This item was complete on P&ID's, but it was not done on inspection ISO's and in the line drawing data base.	CJL
vi) Relief valve data sheets (with sizing calculations);		x	Of the fourteen spot checked, two were missing and four had incomplete calculations.	DCS
vii) Ventilation systems calculation sheets;	x		None were found, including the set for the new control room.	CJL
viii) Emergency shutdown systems;	x		The difference between "quality critical" and "safety critical" systems needs to be noted in the files.	CJL

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Audit item	Yes	No	Comments	Initials
ix) <i>Control and/or monitoring systems specifications (Instrument data sheets); and</i>	x		Same comment as above.	CJL
x) <i>Other appropriate equipment types?</i>	na			
13b. Do the equipment sheets or design files of equipment include appropriate references to codes and standards used?		x	Most PVs, some tanks, some pumps, and all piping make this reference.	CJL
14. Is there documentation that covered equipment complies with generally accepted good engineering practices?	x		This information is missing for some tanks. The inspection frequency on instrument inspection frequencies may not match the manufacturer's recommendations.	CJL
15. For existing equipment designed under codes and standards no longer in use, is there documentation of tests, inspections, operating history, engineering analyses, etc. that show that the equipment is fit for duty?	x		This information is missing for some tanks.	CJL

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D.R.

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WORKSHEETS FOR FIELD VERIFICATION

(continued)

COMPLIANCE AUDIT GUIDELINES SECTION 4.3 PROCESS SAFETY INFORMATION § 29 CFR 1910.119(d)			
8d. Do all equipment meet established electrical classification?			
Spot Check Items	Yes	No	Comments
	x		
9c. Are relief valves properly designed and installed?			
Spot Check Items	Yes	No	Comments
PSV-EX337, EX-338, FI008, & FL009		x	The length of the inlet piping to these relief appear to exceed recommended guidelines.
PSV-FL008, & FL009		x	The inlet piping to these relief valves appears to be smaller than the inlet flange on the relief valve.
PSV-EX338		x	The block under this relief valve was not locked in the open position.

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WORKSHEETS FOR FIELD VERIFICATION
(continued)

COMPLIANCE AUDIT GUIDELINES SECTION 4.3 PROCESS SAFETY INFORMATION § 29 CFR 1910.119(d)			
16. <u>Is drainage or diking adequate?</u>			
Spot Check Items	Yes	No	Comments
VCM Storage Sphere			Unable to determine as there was no technical basis or calculations for this dike..

F.V.

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WORKSHEETS FOR GROUP A INTERVIEW
(Continued)

COMPLIANCE AUDIT GUIDELINES SECTION 4.3 PROCESS SAFETY INFORMATION § 29 CFR 1910.119(d)			
18. Do employees indicate that they have access to the required process safety information? MSDS sheets and other chemical information? Equipment design information? P&ID's?			
Employee Name (Optional)	Yes	No	Comments
	x		MSDS's
	x		P&ID's
	x		Vendor manuals
		x	In general, the group felt they had access to this information but did not know they had access to all PSM information.
Mechanic			He commented that the MSDS system was not adequate and they were hard to find.
19. Do employees indicate that all process safety information is kept current and communicated to all who need to know? How are changes communicated?			
Employee Name (Optional)	Yes	No	Comments
All		x	The group was unanimous in saying this was not done. The consensus was that this information is not kept current.

R. Prillhart, B. Newman
Tommy Staten
J. Hull
JEN

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WORKSHEETS FOR GROUP B INTERVIEW

COMPLIANCE AUDIT GUIDELINES SECTION 4.3 PROCESS SAFETY INFORMATION § 29 CFR 1910.119(d)			
4. Are updated process flow diagrams or block flow diagrams available?			
Employee Name (Optional)	Yes	No	Comments
Consensus		x	These are being developed, but are not available.
5. Does the plant have updated manuals that describe the covered process, <u>process chemistry</u> , <u>maximum intended inventories</u> , and <u>troubleshooting information</u> ? Is the technical basis for design of equipment available?			
Chemistry		x	This is available but not considered accurate or up to date.
Max Inventories		x	
Troubleshooting	x		
Tech basis			The interviewees felt some was available but not for all equipment.

Group B

Erik Smith
Rusty Prillhart

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COMPLIANCE AUDIT GUIDELINES SECTION 4.3 PROCESS SAFETY INFORMATION § 29 CFR 1910.119(d)				
Suggested Questions	Yes	No	Comments for Implementation Status	Initials
1. Are process safety information complete and up-to-date (before conducting process hazard analyses)?		x	Not all required information was complete at the start of the PHA.	DCS
2. Are all employees provided reasonable access to all process safety information?	x			DCS
3a. Is there chemical information for all covered chemicals (such as material safety data sheets and hazardous effects of inadvertent mixing of different chemicals)?	x		MSDS are available. Other information is available in the operating procedures and in technical data books. There is no mixing matrix; however, the plant does not believe one is needed.	DCS
Is there information pertaining to the technology of the process:				DCS
4. Updated process flow diagrams or block flow diagrams?		x	PFDs are in the process of being made.	DCS
5. <u>process description, process chemistry, maximum intended inventories, and troubleshooting information?</u>			This information is in operating procedures and employees offices. It may not be complete.	DCS
6. Safe upper and lower limits for process parameters and consequences of deviation (how were these information obtained)?	x		In the operating procedures.	
	x			
Is there information pertaining to the equipment in the process:				

PSM Steering Team Int.
 CMM SCH JDD
 JBA SJV JAB

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Suggested Questions	Yes	No	Comments for Implementation Status	Initials
7. Updated P&IDs (how often are P&IDs being updated)?	x		P&IDs are redlined as needed and redrawn every 2-3 months.	CJL
8. Electrical classification for different areas (does it follow NFPA standard or comparable industry standard and is it indicated on a plot plan)?	x		This is shown on a plot plan and was reviewed by Randy Denton.	CJL
9. Design and technical basis for relief valves and/or relief headers?		x	These are kept in the "PSM" office. Not all are done, for example the New Module.	DCS
10. Technical basis for design of ventilation system (for all control buildings and process buildings and enclosures)?		x		DCS
11. Material and energy balances for all covered processes built after 5/26/92?	na			DCS
12. Description of safety systems (such as scrubbers, dikes, firewater systems, emergency generators or UPS, control systems and flares, etc.)?	x		Most of these are in the operating procedures and fire systems information is kept in the safety department.	DCS
13a. Equipment sheets and/or design files for all equipment?			These are in the "PSM" office and Mechanical records. Not all are available.	CJL
13b. Do the equipment sheets or design files of equipment include appropriate references to codes and standards used?			Some do, but some may be missing.	CJL

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Suggested Questions	Yes	No	Comments for Implementation Status	Initials
14. Is there documentation that covered equipment complies with generally accepted good engineering practices?	x	x	Check in the equipment files and in Don Whattley's office. (Whattley is the resident inspector)	CJL
15. For existing equipment designed under codes and standards no longer in use, is there documentation of tests, inspections, operating history, engineering analyses, etc. that show that the equipment is fit for duty?	x	x	Same as above.	CJL

PSM S.T.

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Audit item	Yes	No	Comments	Initials
1. Is process safety information complete and up-to-date before a process hazard analysis is conducted?		x	Interview comments indicate that some information was not complete at the start of the PHA. Also, the comments indicated that this did not hinder the PHA.	DCS
2. Are all employees provided reasonable access to all PSM documents (e.g., are official hard copies or electronic copies of P&IDs and operating procedures available at all times in the control room or principle workplace for operator)?	x			DCS
3a. Is there chemical information for all covered chemicals?	x			DCS
3b. Does the compilation of chemicals information include all the information required by law?				DCS
i) Toxicity information;	x		MSDS	DCS
ii) Permissible exposure limits (when available);	x		MSDS	DCS
iii) Physical data;	x		MSDS and technical data references.	DCS
iv) Reactivity data;	x		Technical references.	DCS

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Documentation Review