

II. Process Safety Information Program

Nevada Division of Environmental Protection Chemical Accident Prevention Program

Element Audit Checklist

Revision 3, 03/12/09



| | | | |
|---|-----------------------------|--|-----------------------|
| Facility: | Process(es) Covered: | Date: | |
| A. PROCEDURE/POLICY REVIEW | | | |
| 1) EXISTENCE, COMPLETENESS OF PSI | | Percentage Completion Score – Total 100% (Weighting of Elements is Defined Below) | |
| Overall NDEP-CAPP Element Audit Checklist Score for Process Safety Information Program (as evaluated in sections 2 through 8 below) | | | |
| Notes/Comments Pertaining to Responses to Questions under Issue 1): | | | |
| 2) INFORMATION PERTAINING TO HAZARDS OF SUBSTANCES | | NAC Ref. | Resp. Code |
| <i>Item #2 Completion Score – Weighted 5% of Total</i> | | % | |
| i. Are material safety data sheets (MSDS) or other substance hazard information on site for all highly hazardous substances and explosives? | | 459.95412(2a) | |
| ii. Does the hazard information include all relevant hazard information (refer to MSDS Summary Form)? | | 459.95412(2a) | |
| Notes/Comments Pertaining to Responses to Questions under Issue 2): | | | |

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| 3) INFORMATION PERTAINING TO THE TECHNOLOGY OF THE PROCESS | NAC Ref. | Resp. Code |
|--|----------------|------------|
| <i>Item #3 Completion Score – Weighted 10% of Total</i> | % | |
| i. Has a block flow or simplified Process Flow Diagram been developed? | 459.95412(2b1) | |
| ii. Does a Process Chemistry description exist for current process and does it include the applicable items noted in questions a through d below? | 459.95412(2b2) | |
| a. Describe chemical reactions for primary & secondary reactions? | 459.95412(2b2) | |
| b. Describe the type and nature of catalysts used? | 459.95412(2b2) | |
| c. Describe competing side reactions? | 459.95412(2b2) | |
| d. Describe undesirable chemical reactions such as decompositions and auto polymerizations? | 459.95412(2b2) | |
| iii. Is the maximum intended onsite inventory defined? | 459.95412(2b3) | |
| iv. Are Safe Limits for process variable(s), along with the basis, defined and consistent with design criteria defined in section 4 for variables 1 through 7 below? | 459.95412(2b4) | |
| a. Pressures | 459.95412(2b4) | |
| b. Temperatures | 459.95412(2b4) | |
| c. Flows | 459.95412(2b4) | |
| d. Stream Composition Limits | 459.95412(2b4) | |
| e. Minimum Pipe and Vessel Wall Thickness | 459.95412(2b4) | |
| f. Rotating Equipment Tolerances, Such as Vibration Limits | 459.95412(2b4) | |
| g. Other Process Mechanical Limit(s) | 459.95412(2b4) | |

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| v. | Have the Consequences of Deviating outside the variable(s) limits been evaluated for variables 1 through 7 below? | 459.95412(2b5) | |
| a. | Pressures | 459.95412(2b5) | |
| b. | Temperatures | 459.95412(2b5) | |
| c. | Flows | 459.95412(2b5) | |
| d. | Stream Composition Limits | 459.95412(2b5) | |
| e. | Minimum Pipe and Vessel Wall Thickness | 459.95412(2b5) | |
| f. | Rotating Equipment Tolerances, Such as Vibration Limits | 459.95412(2b5) | |
| g. | Other Process Mechanical Limit(s) | 459.95412(2b5) | |
| Notes/Comments Pertaining to Responses to Questions under Issue 3): | | | |
| 4) INFORMATION RELATED TO THE EQUIPMENT OF THE PROCESS | | NAC Ref. | Resp. Code |
| <i>Item #4 Completion Score – Weighted 15% of Total</i> | | % | |
| i. | Have comprehensive equipment and piping design information been developed? | 459.95412(2c1) | |
| ii. | Have equipment & piping materials been evaluated for compatibility with process fluids? | 459.95412(3&4) | |
| iii. | Have design parameters (e.g., temperature, pressure, etc.) been defined for equipment and piping; and is the equipment and piping capable of handling the maximum and minimum process conditions? | 459.95412(3&4) | |
| iv. | Have comprehensive instrument design information been developed? | 459.95412(2c1) | |

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| v. | Have instruments been evaluated for compatibility with process fluids? | 459.95412(3&4) | |
| vi. | Have design parameters (e.g., temperature, pressure, etc.) been defined for instruments, and are instruments capable of handling the maximum and minimum process conditions? | 459.95412(3&4) | |
| vii. | Do Piping & Instrument Diagrams (P&IDs) cover the entire regulated process, including process auxiliary systems and utilities? | 459.95412(2c2) | |
| viii. | Do P&IDs contain all process equipment and piping? | 459.95412(2c2) | |
| ix. | Do P&IDs contain all instrumentation? | 459.95412(2c2) | |
| x. | Is control logic readily evident from the P&ID, or if not, is control logic documented in a separate format such as ladder logic diagrams, wiring schematics, SAFE charts? | 459.95412(2c2) | |
| xi. | Has P&ID and control logic accuracy been confirmed by the facility? | 459.95412(2c2) | |
| xii. | Have Electrically Hazardous Areas, defined pursuant to Article 500 of the National Electric Code, been defined? | 459.95412(2c3) | |
| xiii. | Have all electrical components & equipment within defined Electrically Hazardous Areas been evaluated for compatibility with the electrical classification, and found to be compatible? | 459.95412(3&4) | |
| xiv. | Have control rooms and other buildings within Electrically Hazardous Areas been evaluated for compatibility with the electrical classification and found to be compatible? | 459.95412(3&4) | |
| xv. | Have all Pressure Relief Devices been listed with the following information from the actual valve: set pressure and capacity @ defined overpressure (taken from valve nameplate or from vendor data traceable to the valve)? | 459.95412(2c4) | |
| xvi. | Have required relief pressures, rates and sizing basis (e.g., process upset, fire or thermal relief) been determined for each corresponding Pressure Relief Device listed in xv above? | 459.95412(3&4) | |
| xvii. | Have actual Pressure Relief Device pressure settings and capacities been determined to be adequate? | 459.95412(3&4) | |
| xviii. | Has the capacity of pressure relief headers and associated flares or scrubbers been evaluated for adequacy, and has the capacity been determined to be adequate? | 459.95412(3&4) | |
| xix. | For regulated processes enclosed by a building, has the capacity of the Mechanical Ventilation Systems been determined? | 459.95412(2c5) | |
| xx. | Has the required capacity of the building Ventilation System, as required by the Uniform Fire Code, or other relevant and more conservative codes, been evaluated? | 459.95412(3&4) | |
| xxi. | Is there documentation verifying that the building Ventilation System configuration and capacity are adequate? | 459.95412(3&4) | |

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| xxii. If building Ventilation System includes a scrubber for toxic or highly toxic compressed gases, does it meet requirements of Uniform Fire Code, Article 80 (section 8003.3.1.3.5) or other nationally recognized code? | 459.95412(3&4) | |
| xxiii. Does the building Ventilation System meet Uniform Fire Code requirements or other nationally recognized code? | 459.95412(3&4) | |
| xxiv. Do Heat & Material Balances exist for the regulated process (not mandatory if the process was built before May 26, 1992)? | 459.95412(2c7) | |
| xxv. Do Heat & Material Balances show, at a minimum: stream pressure, temperature, composition (including minor concentrations of toxics and corrosives), physical properties (e.g., as molecular weight, density, viscosity, etc.), and thermodynamic properties? | 459.95412(2c7) | |
| Notes/Comments Pertaining to Responses to Questions under Issue 4): | | |
| 5) DESCRIPTION OF SAFETY SYSTEMS AND THEIR FUNCTIONS | NAC Ref. | Resp. Code |
| <i>Item #5 Completion Score – Weighted 5% of Total</i> | % | |
| i. Has a Safety System Description, SSD, been developed and does it include the applicable systems noted in questions 1 through 11 below? | 459.95412(2c8) | |
| a. If process is covered by an Emergency Shut-Down System, is it discussed in the SSD? | 459.95412(2c8) | |
| b. If the process area has Toxic Gas Sensors, are they discussed in the SSD? | 459.95412(2c8) | |
| c. If the process area has Combustible Gas Sensors, are they discussed in the SSD? | 459.95412(2c8) | |
| d. If the process area has Flame Detectors, are they discussed in the SSD? | 459.95412(2c8) | |
| e. If the process has a Firewater System, is it discussed in the SSD? | 459.95412(2c8) | |
| f. If the process has an Emergency Generator, is it discussed in the SSD? | 459.95412(2c8) | |
| g. If the process has an Uninterruptible Power Supply, UPS, is it discussed in the SSD? | 459.95412(2c8) | |

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| h. | If the process has a Flare System, Incinerator or Vent Scrubber, is it discussed in the SSD? | | 459.95412(2c8) | |
| i. | If there are audible or visual Alarms, are they discussed in the SSD? | | 459.95412(2c8) | |
| j. | If the process has an associated building Ventilation System, is it discussed in the SSD? | | 459.95412(2c8) | |
| k. | Are there other safety systems (list below)? If so, are they discussed in the SSD? | | 459.95412(2c8) | |
| Notes/Comments Pertaining to Responses to Questions under Issue 5): | | | | |
| 6) EVALUATION OF CODE APPLICABILITY AND COMPLIANCE | | | NAC Ref. | Resp. Code |
| <i>Item #6 Completion Score – Weighted 10% of Total</i> | | | % | |
| i. | Have applicable codes, specifications, and/or best engineering practices been defined by the facility (refer to PSI data forms)? | | 459.95412(2c6) | |
| ii. | Has compliance been evaluated with codes, specifications, and/or best engineering practices by the facility (refer to PSI data forms)? | | 459.95412(3&4) | |
| iii. | Have deficiencies with codes, specifications, and/or best engineering practices been corrected? | | 459.95412(3&4) | |
| Notes/Comments Pertaining to Responses to Questions under Issue 6): | | | | |
| 7) MANAGEMENT PLAN AND DOCUMENT CONTROL | | | NAC Ref. | Resp. Code |
| <i>Item #7 Completion Score – Weighted 5% of Total</i> | | | % | |
| i. | Is there a site-specific plan that addresses how the PSI requirements will be developed and maintained, and does it include applicable portions of items a through f below? | | 459.95341 | |
| a. | Document the names of person(s) who are members of the team with overall responsibility for the development, implementation and integration of the Process Safety Information Program Requirements? | | 459.95341 | |

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| b. | How is facility program monitored for compliance with NAC 459.95412, CAPP Process Safety Information Program? | 459.95341 | |
| c. | Has the facility documented how the PSI for the hazards of the highly hazardous substances or explosives will be compiled? | 459.95341 | |
| d. | Has the facility documented how the PSI for the technology of the process will be compiled? | 459.95341 | |
| e. | Has the facility documented how the PSI for the equipment of the process will be compiled? | 459.95341 | |
| f. | Has the facility documented how processes and equipment will be evaluated for conformance to applicable codes, standards and good engineering practices? | 459.95341 | |
| g. | Has the facility documented how processes and equipment will be documented that they comply with recognized and generally accepted good engineering practices? | 459.95341 | |
| ii. | Is there a site-specific policy or procedure that addresses how PSI documentation is controlled to ensure that the most current information is in circulation and use? | 459.95341 | |
| Notes/Comments Pertaining to Responses to Questions under Issue 7): | | | |
| 8) VERIFICATION OF PSI PROGRAM IMPLEMENTATION | | NAC Ref. | Resp. Code |
| <i>Item #8 Completion Score – Weighted 50% of Total</i> | | % | |
| i. | Is PSI available to employees? <i>Refer to Part B-1</i> | 459.95412 | |
| ii. | Do representative P&IDs appear to be accurate? <i>Refer to Part B-2</i> | 459.95412 | |
| iii. | Do electrical components appear to comply with area classification? <i>Refer to Part B-3(a)</i> | 459.95412 | |
| iv. | Does SSD appear to be complete based on review of Process Flow Diagram, P&ID and on-site inspection? <i>Refer to Part B-3(b)</i> | 459.95412 | |

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| B. ON-SITE INSPECTION - RECORDS AUDIT | | | | |
|---|---|----------------------|-----------------|----------------------|
| 1) VERIFY THAT PSI IS ONSITE, ACCESSIBLE AND CURRENT | | | NAC Ref. | Resp. Code |
| a. | Are MSDS sheets or hazardous substance information on site and available to employees? | | 459.95412 | |
| b. | Are block flow or process flow diagrams, and process chemistry available to employees? | | 459.95412 | |
| c. | Are P&IDs available to employees? | | 459.95412 | |
| d. | Are piping, equipment and instrument specifications available to employees that must use them? | | 459.95412 | |
| e. | Is electrical hazardous area classification information available to employees that must use the information? | | 459.95412 | |
| Notes/Comments Pertaining to Responses to Questions under Issue 1): | | | | |
| | | | | |
| 2) SELECT AT LEAST ONE P&ID FOR FIELD VERIFICATION LIST SELECTED P&ID(S) ON THE FOLLOWING TABLE: | | | | |
| # | P&ID NUMBER | DRAWING TITLE | Revision | Revision Date |
| i | | | | |
| ii | | | | |
| iii | | | | |
| iv | | | | |

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| Inquiry/Observation | Resp. Code : | | | |
|--|-----------------|----|-----|-------------------|
| (Highlight items on P&ID as they are verified in field) | i | ii | iii | iv |
| a. Do the piping and piping components match the drawing? | | | | |
| b. Does a spot check of flanges, fittings and valves indicate conformance to piping specifications? | | | | |
| c. Do the pressure vessels, pumps, compressors, heat exchangers and other equipment match the drawing? | | | | |
| d. Does spot check of pressure vessels, pumps, compressors, heat exchangers and other equipment indicate conformance to equipment specifications? | | | | |
| e. Do instruments match the drawing? | | | | |
| Notes/Comments Pertaining to Responses to Questions under Issue 2): | | | | |
| 3) VERIFY OTHER PSI INFORMATION | NAC Ref. | | | Resp. Code |
| a. From a spot check of electrical components (such as motors, enclosures and instruments) in electrically hazardous locations, does it appear that the components comply with the location? | 459.95412 | | | |
| b. From a spot check of electrical components (such as motors, enclosures and instruments) in electrically hazardous locations, does it appear that the components comply with the location? | 459.95412 | | | |
| c. From the field review, does the PFD appear accurate? | 459.95412 | | | |
| Notes/Comments Pertaining to Responses to Questions under Issue 3): | | | | |
| General On-Site Inspection Notes/Comments: | | | | |



C. INTERVIEWS

1) SELECT TWO OR MORE PERSONNEL TO INTERVIEW REGARDING THE EFFECTIVENESS OF THE INCIDENT INVESTIGATION PSI USING THE FOLLOWING QUESTION SETS

Responses are to be Logged on Following Pages:

| Question Set | Questions to Consider |
|---------------------|--|
| a | What is your job description and associated tasks? |
| b | Do you have access to the Material Safety Data Sheet? |
| c | Was the Process Flow Diagram used in your training? |
| d | Do you have access to the Piping and Instrumentation Diagram(s)? |
| e | Do you have access to the Equipment O&M Manuals? |

2) RECORD RESPONSES OF SELECTED PERSONNEL TO QUESTIONS FROM THE QUESTION SETS

Refer to Part C-1

Employee Profile

| Job Title/Position | Department/Unit/Group | Time in Job | Time w/Co. |
|---------------------------|------------------------------|--------------------|-------------------|
| | | | |

Response to Question Set _:

| |
|--|
| |
|--|