

VI. Mechanical Integrity Program
Nevada Division of Environmental Protection
Chemical Accident Prevention Program
Element Audit Checklist

Revision 4, 09/09/2016



Facility:	Process(es) Covered:		HHS(s):	
Completion Score History	Date	Part A Score	Part B Score	
	xx/xx/xxxx	xx%	xx%	
A. PROCEDURE/POLICY REVIEW				
Documents Reviewed				
Date Reviewed	Title of Document	Rev. #	Date	# Pgs.
1) DEVELOPMENT OF MAINTENANCE PROCEDURES			NAC Ref.	Resp. Code
<i>Item #1 Completion Score – Weighted 30% of Part A</i>			x / 13 = xx%	
<i>In each of the following components, have procedures been developed for maintenance activities and have they been confirmed to follow generally accepted good engineering practices:</i>				
i.	Pressure vessels and storage tanks		459.95421(1a) 459.95421(d)	
ii.	Process piping		459.95421(1a) 459.95421(d)	
iii.	Pressure relief devices		459.95421(1a) 459.95421(d)	
iv.	Pressure relief systems		459.95421(1a) 459.95421(d)	
v.	Scrubber systems		459.95421(1a) 459.95421(d)	
vi.	Building ventilation systems (if CAPP process inside)		459.95421(1a) 459.95421(d)	
vii.	Emergency shutdown systems		459.95421(1a) 459.95421(d)	
viii.	Instrumentation		459.95421(1a) 459.95421(d)	
ix.	Sensors		459.95421(1a) 459.95421(d)	

Response Code (Point Valve): Y = Yes (1), N = No (0), NA = Not Applicable (Not Scored), U = Undetermined (0), P = Partially Satisfied (½), NR = Not Reviewed (Not Scored), R = Reviewed (1)

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x. Alarms systems	459.95421(1a) 459.95421(d)	
xi. Pumps	459.95421(1a) 459.95421(d)	
xii. Compressors	459.95421(1a) 459.95421(d)	
xiii. Other equipment?	459.95421(1a) 459.95421(d)	
Notes/Comments Pertaining to Responses to Questions under Issue 1):		
2) PM SCHEDULE: DETERMINATION OF REQUIRED MAINTENANCE FREQUENCY	NAC Ref.	Resp. Code
<i>Item #2 Completion Score – Weighted 30% of Part A</i>	$x / 13 = \mathbf{xx}\%$	
Has a preventative maintenance schedule been developed for the piping, equipment and instruments; and has the type and frequency of maintenance been determined to be the most conservative of vendor recommendations, best engineering practices or facility experience for the following components:?		
i. Pressure vessels and storage tanks	459.95421(1e)	
ii. Process piping	459.95421(1e)	
iii. Pressure relief devices	459.95421(1e)	
iv. Pressure relief systems	459.95421(1e)	
v. Scrubber systems	459.95421(1e)	
vi. Building ventilation systems (<i>if CAPP process inside</i>)	459.95421(1e)	
vii. Emergency shutdown systems	459.95421(1e)	
viii. Instrumentation	459.95421(1e)	
ix. Sensors	459.95421(1e)	

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x. Alarms systems	459.95421(1e)	
xi. Pumps	459.95421(1e)	
xii. Compressors	459.95421(1e)	
xiii. Other equipment?	459.95421(1e)	
Notes/Comments Pertaining to Responses to Questions under Issue 2):		
3) DEVELOPMENT OF MAINTENANCE TRAINING PROGRAM	NAC Ref.	Resp. Code
<i>Item #3 Completion Score – Weighted 10% of Part A</i>	$x / 3 = \mathbf{xx}\%$	
<i>Is training required for all maintenance personnel in each of the following areas:</i>		
i. An overview of the process and the potential hazards associated with the process?	459.95421(1b1)	
ii. Training in the procedures related to the job tasks, to ensure that the employee can perform the job tasks in a safe manner?	459.95421(1b2)	
iii. Training in management of change provisions, including how to recognize a change that would prompt the need for the MOC?	459.95421(1b3)	
Notes/Comments Pertaining to Responses to Questions under Issue 3):		
4) QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES	NAC Ref.	Resp. Code
<i>Item #4 Completion Score – Weighted 20% of Part A</i>	$x / 3 = \mathbf{xx}\%$	
i. Does the mechanical integrity program provide a mechanism to ensure that new equipment, instruments and controls are checked to ensure suitability with the process?	459.95421(1h)	
ii. Does the mechanical integrity program provide a mechanism to ensure that equipment, instruments and controls are checked to ensure that installation is per design specifications and manufacturers instructions?	459.95421(1i)	
iii. Does the mechanical integrity program provide a mechanism to ensure that maintenance materials, spare parts, and equipment are suitable for the process for which they will be used?	459.95421(1j)	

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Notes/Comments Pertaining to Responses to Questions under Issue 4)		
5) MANAGEMENT PLAN AND DOCUMENT CONTROL	NAC Ref.	Resp. Code
<i>Item #5 Completion Score – Weighted 10% of Part A</i>	$x / 2 = \mathbf{xx}\%$	
i. Is there a site-specific plan that addresses how the Mechanical Integrity Program requirements will be developed and maintained, including:	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 Mechanical Integrity Program Requirements?	459.95341	
b. Does the site-specific plan define the responsibility and method to validate facility Process Safety Information prior to developing or modifying the Mechanical Integrity program element?	459.95341	
c. Does the site-specific plan address how the training program is developed and administered?	459.95341	
d. Does the site-specific plan address how preventive maintenance activities are determined?	459.95341	
e. Does the site-specific plan address how the work order system functions?	459.95341	
ii. Is there a site-specific policy or procedure that addresses how Mechanical Integrity Program 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 5):		
General Procedure/Policy Review Notes/Comments:		



B. ON-SITE INSPECTION - RECORDS AUDIT			
1) VERIFY EXISTENCE AND AVAILABILITY OF MAINTENANCE PROCEDURES		NAC Ref.	Resp. Code
<i>Item #1 Completion Score – Weighted 25% of Part B</i>		$x / 2 = \mathbf{xx}\%$	
i. Do maintenance procedures generally appear to be in place and accessible to maintenance employees as indicated on the data forms for the following components:		459.95421(1a)	
a. Heat Exchangers		459.95421(1a)	
b. Other Types of Pressure Vessels & Storage Tanks		459.95421(1a)	
c. Piping Systems		459.95421(1a)	
d. Manual Valves		459.95421(1a)	
e. Pressure relief devices		459.95421(1a)	
f. Pressure relief systems (<i>pressure relief discharge headers and flare systems</i>)		459.95421(1a)	
g. Scrubber systems		459.95421(1a)	
h. Building ventilation systems (<i>if CAPP process inside</i>)		459.95421(1a)	
i. Emergency shutdown systems		459.95421(1a)	
j. Instrumentation		459.95421(1a)	
k. Sensors (<i>toxic/combustible gas, flame</i>)		459.95421(1a)	
l. Alarm systems		459.95421(1a)	
m. Pumps		459.95421(1a)	

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n. Compressors		459.95421(1a)	
o. Other equipment?		459.95421(1a)	
ii. Do the safe work practices appear to be in place and accessible to maintenance employees and is there evidence of their use:		459.95421(1a)	
a. Hot Work		459.95421(1a)	
b. Lockout/Tagout		459.95421(1a)	
c. Confined Space		459.95421(1a)	
d. Process Equipment Opening / Line Breaking		459.95421(1a)	
e. Controlled Access		459.95421(1a)	
f. Other type of safe work permit?		459.95421(1a)	
Notes/Comments Pertaining to Responses to Questions under Issue 1):			
2) SELECT 2 TO 4 EMPLOYEE TRAINING FILES/RECORDS TO REVIEW AGAINST ACTUAL PRACTICE <i>List on the Following Table:</i>		NAC 459.95421(1b)	
Item #2 Completion Score – Weighted 25% of Part B		x / 4 = xx%	
#	Employee ID # or Name	Job Description or Title of Position	
i			
ii			
iii			
iv			

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Inquiry/Observation				Response Code:			
				i	ii	iii	iv
Do the records indicate the date & substance of training and comprehension records for:							
a. Relevant safe work practices?							
b. Job safety training?							
c. Overview of the process and its potential hazards?							
d. Management of Change program?							
e. Based on Response Codes used to complete items 'a' through 'd' above, does a random check of records indicate that training of maintenance personnel is being conducted as required by this section?							
Notes/Comments Pertaining to Responses to Questions under Issue 2):							
3) REVIEW THE SYSTEM USED TO SCHEDULE AND TRACK MAINTENANCE ACTIVITIES. SELECT 2 TO 4 COMPONENTS FOR SPECIFIC REVIEW <i>List on the Following Table:</i>						NAC 459.95421(1)	
Item #3 Completion Score – Weighted 25% of Part B						x / 4 = xx%	
#	Component ID #	Component Description (Valve, Vessel, Pump, etc.)	Type of Activity (Scheduled PM or Repair)	Work Order Identifier			
i							
ii							
iii							
iv							
Inquiry/Observation				Response Code:			

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				i	ii	iii	iv
a. Is the component being maintained pursuant to the schedule?							
b. Is the maintenance activity & frequency based upon the most conservative criteria?							
c. Is the following information being provided in the maintenance record: Date of activity?							
d. Is the following information being provided in the maintenance record: Name of inspector or maintenance person?							
e. Is the following information being provided in the maintenance record: Serial number or component identifier?							
f. Is the following information being provided in the maintenance record: Description of inspection or test (or required repair activity)?							
g. Is the following information being provided in the maintenance record: Results of inspection or test?							
h. Is there a maintenance procedure associated with this activity?							
i. Are there safe work practices associated with this activity?							
j. If a repair of equipment operating outside of acceptable limits (as defined in the PSI), was the deficiency corrected before returning to service?							
k. Based on Response Codes used to complete items 'a' through 'j' above, does a random check of records indicate that scheduled maintenance activities are being completed and properly documented?							
Notes/Comments Pertaining to Responses to Questions under Issue 3):							
4) REVIEW QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PRACTICES <i>List on the Following Table:</i>						NAC 459.95421(1)	
Item #4 Completion Score – Weighted 25% of Part B						x / 4 = xx%	
#	Component ID #	Component Description (Valve, Vessel, Pump, etc.)	Design Spec ID / PO #	Work Order Identifier			
i							

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ii								
iii								
iv								
Inquiry/Observation				Response Code:				
				<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">i</td> <td style="text-align: center;">ii</td> <td style="text-align: center;">iii</td> <td style="text-align: center;">iv</td> </tr> </table>	i	ii	iii	iv
i	ii	iii	iv					
a. Is there evidence that a purchase order for a process component is being confirmed against the design specification?								
b. Is there evidence that the receiving documentation for an item is being confirmed against the applicable purchase order?								
c. Is there evidence that checks are performed to ensure the proper component is installed and is installed properly?								
d. Is there evidence that the suitability of materials, spare parts and equipment for new and existing processes are confirmed?								
e. Based on Response Codes used to complete items 'a' through 'd' above, does a random check of purchasing records and installation work orders indicate that program quality control measures are being implemented?								
Notes/Comments Pertaining to Responses to Questions under Issue 4):								
General On-Site Inspection and Records Audit Notes/Comments:								