

LOSS PREVENTION AUDIT

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Process Hazard Analysis

HAZOP

- C 1. Do any of your unit operations have:
Yes ☐ No ☒ an F&EI of 128 higher?
Yes ☒ No ☐ a C.E.I. of 200 or higher or?
Yes ☒ No ☐ meet the criteria for conducting a HAZOP as outlined in
the Process Risk Management Guidelines for Facilities
and Distribution?

Plans: Plan to coordinate formalized HAZOP Review with Loss Prevention.

- B 2. Where a HAZOP Review has been performed (please list areas studied), what is the status of the recommendations from the HAZOP study?

Process	Process Unit
None	

ADDITIONAL RISK EVALUATION

- C 1. Yes ☐ No ☒ Has any additional risk evaluation or quantitative risk assessment been done in your facilities?

Plans: None

- B 2. Yes ☒ No ☐ Do you have a system for tracking risk evaluation recommendations until closed out?

Plans: Action item lists generated (Pre-startup audits: action item and list of status) during pre-startup audits, MOC reviews, etc. are kept and audited until closed out by project owner.

PRE-START UP AUDIT - C-6

PLANT: Chlor-alkali II

PROJECT TITLE: Bird Centrifuge Relocation

DATE: 2/2/94

1. Has the Technology Center approved the process? yes
2. Has any reactive chemical data been generated? N/A
3. Has a reactive chemical review been done since the design was finalized? yes Attach the review letter along with a written answer to any questions that were raised during the review. Has reactive chemical checklist been completed? N/A *no problems*
4. Has Environmental Control reviewed and approved the project? yes
- * 5. When the construction project is essentially complete, a job safety inspection should be made. This inspection should include:

Plant Supervisors	Plant Operators
Plant Engineer/Mfg. Rep.	Safety Department

Their inspection should emphasize:

Pipe, valves, fittings, and associated supports
 Valve location and orientation
 Structures and ladders
 Electrical grounding
 Insulation for personnel protection
 Safety showers
 Fire extinguishers and deluge guns
 Intercom locations
 Lighting
 Line labeling
 Freeze Protection
 PSV's
 Instrumentation
 Has such a review been made? 2/08/94

- * 6. Operator training classes should be held. These classes should highlight the following:
 - A. Project benefits and expected results.
 - B. Process description (include expected operating conditions)
 - C. Process controls
 - D. Operator responsibilities
 - E. New procedures:
 1. Start up
 2. Emergency
 3. Shutdown
 4. Sampling
 5. Job Procedure
 6. Normal Operating Procedure
 7. Lockout/Tagout
 8. Loading/Unloading
 9. Freeze Precaution (normal/severe)
 10. Lab Procedures:
- Has such training been done? Working

7. Procedures should be reviewed by as many plant people as possible and revised as necessary. A plant committee of operations and technical people should make a final safety audit of procedures. Has such a safety audit been done? Yes, by Bill Lively, ST Talalay, Kevin Brown
8. Has the system been pressure tested? yes
Washed or cleaned? no How? yes
- * 9. Is it possible to have a dry run operation such as operating the system on air, nitrogen, or water? do yes If so, has this been done? 2/16/94 Are other plants involved in the new process? no
- * 10. Have all instrument loops been checked and documented? most - rest of #10 during outage
Full range valve stroke? yes Fail safe valve positions verified? yes Have critical instruments been identified and registered? yes
- * 11. Has the new electrical equipment been checked out? Are field switches, equipment and MCC starters labeled properly? Refer to S-316 for electrical safety standards. 2/16/94 dry run Working on labels
12. Have the block operating manual and emergency procedures been modified to include the new project? yes
13. Have pressure vessels and PSV's been added to the computer list? N/A Do PSV's set pressure match design pressures of vessels? N/A
14. Have plant and engineering files and drawings (P&ID's) been updated to include the new equipment? yes
15. Has a list of necessary spare parts been added to the existing spare parts stocking list? yes
16. Have training classes been set up for maintenance of the new equipment? N/A
17. Has all associated equipment been checked? yes
18. Has a review of the control system been completed? yes
If computer control, has a simulation been done? yes

This check sheet must be filled out and reviewed with the Plant Superintendent prior to the start up of a new project.

3/93

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PROJECT AND MODIFICATIONS SAFETY ASSESSMENT

PLANT CA2 TITLE BIRD CENTRIFUGE RELOCATION

Underline those factors which have been changed by the proposal.

PROCESS CONDITIONS

temperature
pressure
flow
level
composition
toxicity
flash point
reaction conditions

OPERATING METHODS

start-up
routine operation
shutdown
going through explosive
range
preparation for maintenance
abnormal operation
emergency operation
layout and positioning of
controls & instruments

ENGINEERING METHODS

trip and alarm testing
maintenance procedures
inspection
portable equipment

SAFETY EQUIPMENT

fire fighting &
detection systems
means of escape
safety equipment for
personnel
showers & eyewashes

ENVIRONMENTAL CONDITIONS

liquid effluent
solid effluent
gaseous effluent
noise
dust
diking

UTILITIES

power, steam, nitrogen,
water, air, fuel gas

ENGINEERING HARDWARE & DESIGN

line diagram
wiring diagram
electrical feeders distribution
plant layout ← improved
design pressure
design temperature
materials of construction
loads on, or strength of:

foundations
structures
vessels
pipework/supports/bellows
temporary or permanent:
pipework/supports/bellows
valves
slip-plates
restriction plates
filters

instrumentation ← improved
trips and alarms ← improved
static electricity - grounding
lightning protection
radioactivity

rate of corrosion
rate of erosion
isolation for maintenance
maintenance - electrical
fire protection of cables

handrails ← improved
ladders ← improved
platforms ← improved
walkways

tripping hazards
access for: ← improved
operation
maintenance
vehicles
plant
fire fighting

underground overhead:
service
equipment
safety relief devices
normal freeze protection
severe freeze protection
(20 deg. F, -10 deg. F
windchill)

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Within the categories listed below, does the proposal	YES	NO	What problem has been created which affects plant or personnel safety & what action is recommended to minimize it?
RELIEF AND BLOWDOWN			
1. Introduce or alter any potential cause of over/under pressure (or raising or lowering the temperature in) the system or part of it?		X	
2. Introduce a risk of creating a vacuum in the system or part of it?		X	
3. In any way affect equipment already installed for the purpose of preventing or minimizing over or under pressure?		X	
4. Overloading of flare, blowdown or incinerator system?		X	
AREA CLASSIFICATION			
5. Introduce or alter the location of potential leaks of flammable material?		X	
6. Alter the chemical composition or the physical properties of the process material?*		X	
7. Introduce new or alter existing electrical equipment?		X	
SAFETY EQUIPMENT			
8. Require the provision of additional safety equipment?*		X	
9. Affect existing safety equipment?*		X	
OPERATION AND DESIGN			
10. Introduce new or alter existing hardware?	X		
11. Require consideration of the relevant Codes of Practice and Specifications?		X	
12. Affect the process or equipment upstream or downstream of the change?*	X		D311 Sampling in lieu of D352
13. Affect utilities or other plants in the Division?		X	
14. Affect safe access for personnel and equipment, safe places or work and safe layout?	X		IMPROVES THIS
15. Require revision of equipment inspection frequencies?		X	
16. Affect any existing trip or alarm protection?	X		MOD II Control - Additional Alarms
17. Affect the reaction stability or controllability of the process?*		X	
18. Affect existing operating or maintenance procedures or require new procedures?	X		Procedures revised
19. Alter the composition of, or means of disposal of effluent		X	
20. Alter noise level?*	X		IMPROVES THIS
21. Have Loss Prevention Principles been reviewed?	X		
22. Is designed to operate through a normal freeze, not a severe freeze?	X		
*If y s, consider contact with Environmental Control, Reactive Chemicals, Safety and Loss Prevention, Industrial Hygiene groups or Engineering Services.			

Checked by RA Thud Plant Superintendent Checked by _____ Engineer
2/8/94 Date _____ Date

3/93

SAFETY REFERENCE C-6
 PRE-START UP AUDIT

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PRE-STARTUP AUDIT ATTENDANCE SHEET

PROJECT TITLE: Caustic Centrifuge - CA#2

AUDIT DATE: 2/8/94

STARTUP DATE: _____

ATTENDEES:

NAME	DEPARTMENT	POSITION
Dominic Landry	CA#2	Safety & Training Coord.
Steve Salala	CA#2	Engineer
Roger Hudson	CA#2	Plant Supt.
Allan Lindor	CA#2	Prod. Supt.
Monty Hens	Cl ₂	Acting Safety Supt.
Andy Williams	CA#2	operation.

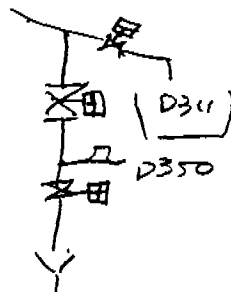
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1. 2" extension from plw header around deck in order to wash out salt in trench & keep it moving. (Manual valve) (BILL)

2. May need to cut off piping going into trenching a little closer to the grating so it does not impede flow. (BILL)

3. 10" BF valves to D311: How much leakby into D311 will there be during a wash & subseq. shutdown? (?)

4. Need an alarm on auto "clearwater to trench" valves as this is a potential for high caustic losses. (ME)



5. Change out all "temporary" valves for spec valves esp. the 2" steam valves on the condenser to the chiller casing loop.

6. PAINT X-brace on middle deck to avoid head bump (Odas)

7. Kick plate around Bird monobases/stairs (Odas)

8. Platform for tank cone valves (Kevin)

9. Rotate/activate manual section valves to P-351's (Kevin)

10. D311 failure (ME)

11. Grease all valves < startup. (Bill)

12. Flange clearances on middle deck (Bill)

13. Platform not a headbanger, (Bill)

14. T302 (Bill)
D350 (Bill)

15. P-351 discharges close together (Bill/Kevin)

16. Insul. piping: turn corners with insul. (Bill)

17. NO BYPASS AROUND CARRIER WATER CONTROL VALVES + NO BLOCK VALVE UP/DOWN STREAM OF CONTROL VALVES (KEVIN)

8/10/93

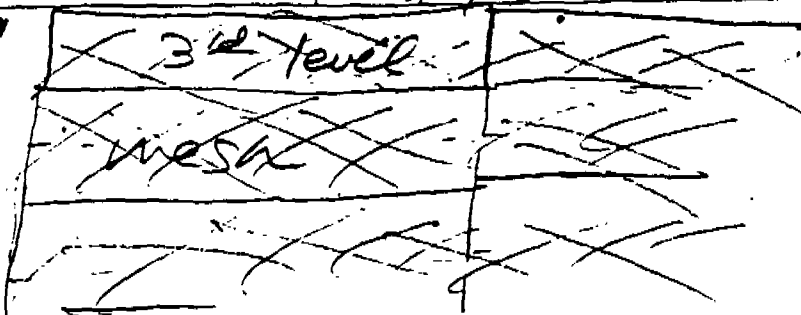
JTT

P.

2/.

(17)

Larry



Add extra straps
to railing on D-311
side on both decks.
(pet)

~~18~~ Check P-314 HP rating for ^{full} recycle, etc. (Steve)

~~19~~ Bypass ^{extra valve} on salt slurry loop; salt packing problem (Bill)

~~20~~ Relocate D-311 level transmitters to the middle deck
& demo ladder

~~21~~ DB, & B on local pump line washes.

~~22~~ P-357 LCV loop will remain & be monitored
during startup. If we have plugging problems,
will shutdown & redo then (Bill & Steve)

Larry ~~23~~ Sample point valves (special) for D-357A/B

Larry ~~24~~ PVC gutter needs more support.

~~25~~ Shell wash extra nozzles (The Caustic's unclean
(hold off for now) (Beaux)

~~26~~ Wilbert: check on strength of grating cover
over trench between P-314's & new deck. (FRA)

~~27~~ Split gearbox guards in half to eliminate rig.

~~28~~ Bypass on carrier water or tops? (Kevin)

LARRY

~~(29)~~

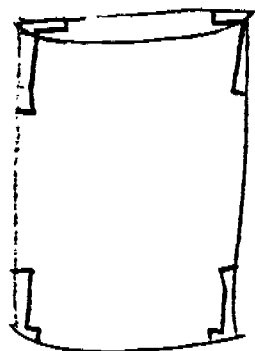
Pipe touching brace on 2nd deck - feed pipe
(Kevin)

~~(30)~~

LIP ON SALT AND LIQUID END
OF BIRD LIDS to protect
gasket



"Turn the corner"



~~(31)~~

Sand & glue on the carbs
on bottom level

Bobby Monette

~~(32)~~

Replace grating with cast iron grate S. of bottom
level in thruway. (10/20/93 Bob Biggs)

~~(33)~~

P-351 pumps need DBTB on pumpkin wash

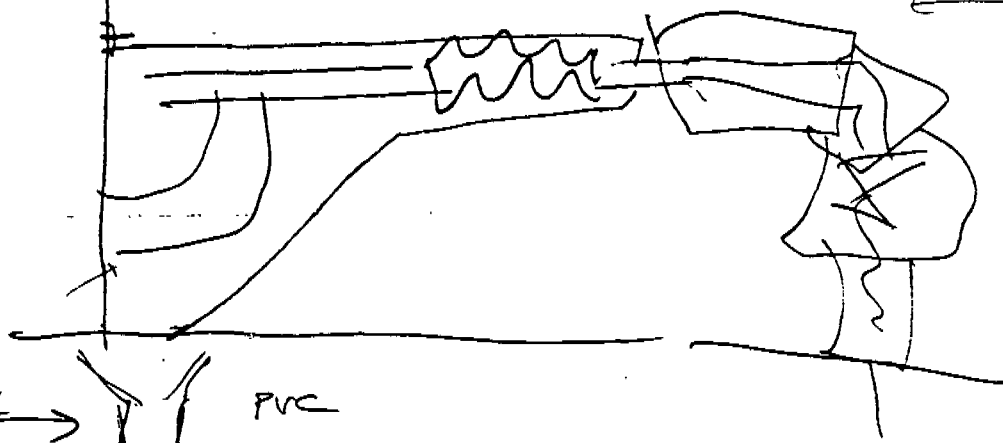
~~(34)~~

Galv. bolts on lid/casing joint, w/ dowel pins
USE ALLOY.

① Covering over feedpipe/exp. Jt.

Bolt to belt guard.
Rubber seal just exp. Jt.
Drain to 2nd deck

TOP DECK



Larry

② "Double nut" exp. Jt. limiters (all thread)

③ Chuck water on "A" side - socket weld bleed - change to threaded or modify so open. Can keep plug in it or attach hose. (Add threaded nipple & cap)

④ What is Xformer on top deck? PMW

⑤ Has motor been greased? (no grease or all grease)

⑥ Tag for start-stop on Bird.

⑦ Move conduit to flowmeter to inside

⑧ PAINT MOTOR & BIRD
GREY WHITE

⑨ Hang Fire exchanger

⑩ PAINT ~~STAIN~~ GALV "STABS" - welds are already rusty.
4 total top deck

⑪ Blankets for feed lines upstairs

~~Galv bolts / GS doull pins.~~

SJT
1/6/94

MIDDLE DECK

OIL MIST COLLECTION

- ① Label oil collection pots
- ② Touch up bracket mount for collection pots
- ③ Personnel Protection insul - feed lines - overflow clean
- ④ D-351A 2" Nozzle - looks like it elbows
needs a teflon spacer to protect from Caustic

⑤ Touch up hanging deck Braces

BOTTOM DECK

⑥ PVC drain pipe on D355 side - straighten out & eliminate brace - looks

⑦ Quick opening valves to make P-351 A/B
suction washwater DBFB. Also convert bleed
to threaded (using nipple & cap)

⑧ PP insul on slurry station & D-351 cones/lines
essentially all P351/D351 piping, but not tanks.

⑨ Label start stops & P351's.

⑩ Nickel pipe on trench washout.

⑪ Oil mist vent valves & other stuff.

⑫ REMOVE ALL adjustable "VALVES" FROM
CONDUIT & LEAVE OPEN to allow
drainage

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