



Roaster Shut Induction

Rev. 3 April 1, 2024

April – May 2024

Contractor Obligations

- **Full Compliance with the Shut Safety Management Plan**
- **Communicate these Obligations from the Shut Safety Management Plan to your Personnel prior to the start of work**
- **Provide all necessary PPE to your personnel**
- **Report all injuries and near misses to the Nyrstar Safety Department and Project Manager immediately (same shift)**

- **Achieve the Key Performance Indicators for Injuries**
 - **No Lost Time Incidents or Medical Recordable Injuries**
 - **All Injury Frequency Rate of less than 100**



Emergency Procedures

- Plant Weather alarm will be used for all weather related emergencies (Long Siren type Wail)
- Evacuation notification of the Roaster area will be by 4 air horn blasts and announcement and by radio contact
- Respond to the designated Employee Assembly Areas and Account for your personnel

Basic PPE Requirements

- ANSI Approved Hard Hats w/Hi Viz
- ANSI Approved Safety Toed Footwear
- ANSI Approved Eyewear w / Side Shields
- Long Trousers
- Hi-Viz with reflective stripes on the Upper Body – ANSI Type II
- Long Sleeves
- Gloves
- Respirators as needed –
(Medical & Fit Tests less than 1 year old must be on file with Nyrstar Safety if a negative pressure respirator will be used)



Access to Site - Contractors

- Contractors must report to the security office on day one of their arrival to check in and receive their access card
- All Requirements listed on the following page must be turned in and current **PRIOR** to any team member being allowed entry to the Nyrstar plant. (Please make sure all documentation is sent to the Nyrstar Safety team prior to your teams arrival at the following emails!)

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Access to Site - Contractors

- Drug Test Results – **9 Panel Minimum**
- Current **OSHA** Training Documentation
- Current Company COI (on file)
- Nyrstar reserves the right to perform alcohol screenings randomly at any time
- Medical & Fit Tests less than 1 year old – if a negative pressure respirator will be used
- Contract Employees will receive a Turnstile Card –
 - Access card will be good for the Job Duration
 - All Employees must badge in each day
- Vehicles – On Site
 - Limited to only those that are necessary to work from
 - Backup Alarms / Flashing Light

Area Access Limitations

- Roaster / Boiler Area – Respirator Required
(Lead / Cadmium Exposures / No Smoking)
- Acid Plant – Full Acid Protective Gear
(Concentrated Sulfuric Acid Exposure
BUMB Solution / Breaking Acid Lines)



This will remain in effect until the areas become de-regulated work areas under the direction of the Safety Manager and Area Superintendent.

Respiratory Protection

Demolition / Cleaning inside roaster or boiler, or Cutting of refractory brick

- Minimum level of respiratory protection for those involved in the demo or cleaning inside the roaster or waste heat boiler shall be any powered, air purifying respirator (PAPR) with a helmet and hood (APF = 1,000) .
- Minimum level of respiratory protection for anyone demolishing, dry-cutting or grinding refractory brick shall be any PAPR with a tight-fitting face piece and a high-efficiency particulate filter (APF = 50).

Respiratory Protection (cont.)

Other work in regulated area

- For other work in the regulated area, the minimum level of respiratory protection shall be any particulate respirator equipped with one of the following filters: N95, R95, P95, N99, R99, P99, N100, R100, or P100 (APF = 10). **No quarter-mask respirators shall be used; half-face is the minimum standard.**
- Anyone wet-cutting refractory brick will also use this level of respiratory protection as the minimum standard. Anyone demolishing, dry-cutting or grinding refractory brick will use the higher APF = 50 standard of respiratory protection

Shut Activities

Respect Barricaded Areas

- Red – No entry without permission from the owner of the barricade
- Yellow – Check for hazards before entry & make sure to be wearing the appropriate PPE



Hang a barricade tag on each side of barricade that warns of the hazard and identifies the owner of the barricade.

Shut Activities

- Traffic – Vehicles, Mobile Cranes and Personnel
 - Use spotters when backing or in congested areas
 - Seat belts use is mandatory
- Emergency Response (**Security Channel on Radio**)
 - Local emergency responders are 15 minutes away
- Accident / Near Miss Reporting Requirements
 - Report to contractor supervisor and Nyrstar job owner & Nyrstar Safety department immediately (same shift)
- ‘Stop for Each Other’ Program
 - This is Nyrstar’s job task observation program. Others may stop and observe your work and discuss with you.

Shut Activities

■ SOPs and Risk Assessments

Reviewed and Completed Prior to Tasks

I Isolations and Lock Outs

- **Brown Locks** with Tags that ID Contractor, Employee & Date are required for each team member on site.
- Each Contractor Group must be kept on the same multi-lock hasp.



Documented Lift Plans

Must be completed and approved by Nyrstar Safety prior to lifts of 2 Short Tons or more. Mobile Cranes will Sound Horns prior to Lifts and must be barricaded at all times. **Never walk under a suspended load.**

Shut Activities

Confined Space Entry Requirements

*Entry Permits / Attendants w/ Radio / Air Monitoring
(before & during any entry)*

Hot Work Permits

- Welding, Cutting, and Grinding
- Mandatory Fire Watch – 60 minutes after task is complete

Working at Heights

- Any work location where personnel can fall
- Use an **SRL (yo-yo)** while on Aerial Lifts
- Red Barricade with tags must be placed around work area
- Scaffolding – Pre-use Documented Inspections & Must have a Green “OK” / Yellow Tag before use
- Tether/lanyard your tools while working at heights



Shut Activities

Working at Heights:

All Equipment must be inspected prior to using on Nyrstar property. An inspection will be signified by attaching the correct color zip tie to each individual piece of equipment. Zip Ties will be made available at the Security gate if needed.



Shut Access Route

- Site Map (Handout)
- Through Security Gate
- Right onto Main Street
- Left Into Roaster / Acid / Converter / Cooling Towers








Daniel's bldg


TOP OF THE HILL


LEGEND

 GFL DUMPSTERS AND BINS (13ea) PERMANENT ON-SITE
 PERMANENT ON-SITE

 GENERATORS (15ea)

 PORTA-JOHNs (9ea) PERMANENT ON-SITE
 Additional Porta-Johns (8) returned once SMO is done

 TRAILER LOCATIONS FOR CONTRACTORS **WH OTHER LOCATION WILL A CONTRACTOR PARK THEIR TRAILER?**

 SANITIZER STATIONS (2ea) PERMANENT ON-SITE

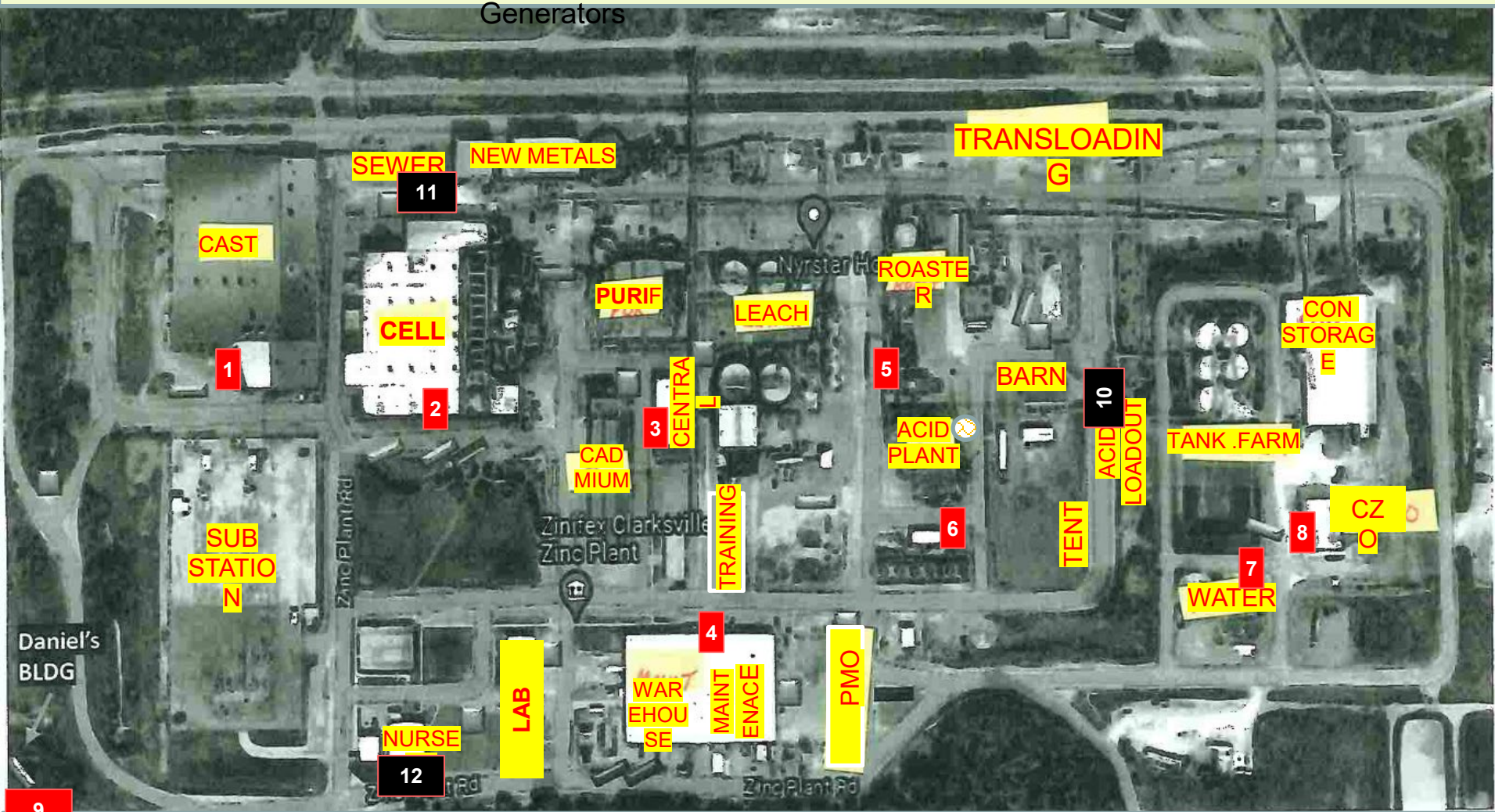
 Additional HAND WASH STATIONS (8) returned once SMO is





SMO24 ≥ 5kva Generators

Single φ Portable Generators



- | | | | |
|--------------------------------|---------------------------------|----------------------------|------------------------------------|
| 1) Cast House – 4 ea 150 kva ✓ | 2) Cell House – 1 ea – 50 kva | 3) Central L&P – 1 ea 5kva | 4) Whse/lab/maint/pmo 1 ea 50kva ✓ |
| 5) Roaster – 1 ea 50 kva | 6) Cooling Towers 1 ea - 50 kva | 7) Water Plant-1 ea 5 kva | 8) CZO – 1 ea 50 kva ✓ |
| 9) Admin Server 1 ea 5 kva ✓ | 10) Acid Loadout- 1 ea φ ✓ | 11) SEWAGE – 1ea φ ✓ | 12) Guard House – 1 ea φ ✓ |

Working Hours

For contractors working on the SMO, working hours will be limited to no more than thirteen hours a day, with at least 10 hours offsite. As well as, no more than thirteen consecutive days without a day off.

Exceptions will be made on a case-by-case basis with approval of a Nyrstar manager.



SHUT Medical Station



Nyrstar will Provide a designated area for Medical supplies and Emergency Equipment. This will be located in close proximity to the SHUT area and will be clearly marked.



A Hydration Station will be set up in the same area for convenience and for visibility.

Please make sure to familiarize your team with this area prior to beginning work.

Heat Stress Management

Contractors are expected to manage their heat stress exposures in accordance with the NIOSH Work/Rest Schedules on the next slide. Cooling methods including ventilation should be employed as necessary to maintain the temperature of work areas in the green/"Normal" zone according to the NIOSH Work/Rest Schedules chart.

Rest and Hydration Areas will be provided near the SHUT areas.

Heat Stress Management

HEAT STRESS Work/Rest Schedules

Examples of Work at Different Intensity Levels

Light work

- Operating equipment
- Inspection work
- Walking on flat, level ground
- Using light hand tools (wrench, pliers, etc.). However, this may be moderate work depending on the task
- Travel by conveyance

Moderate work

- Jack-leg drilling
- Installing ground support
- Loading explosives
- Carrying equipment/supplies weighing 20–40 pounds
- Using hand tools (shovel, fin-hoe, scaling bar) for short periods

Heavy work

- Climbing
- Carrying equipment/supplies weighing 40 pounds or more
- Installing utilities
- Using hand tools (shovel, fin-hoe, scaling bar) for extended periods

Temperature (°F)	Light Work Minutes Work/Rest	Moderate Work Minutes Work/Rest	Heavy Work Minutes Work/Rest
90	Normal	Normal	Normal
91	Normal	Normal	Normal
92	Normal	Normal	Normal
93	Normal	Normal	Normal
94	Normal	Normal	Normal
95	Normal	Normal	45/15
96	Normal	Normal	45/15
97	Normal	Normal	40/20
98	Normal	Normal	35/25
99	Normal	Normal	35/25
100	Normal	45/15	30/30
101	Normal	40/20	30/30
102	Normal	35/25	25/35
103	Normal	30/30	20/40
104	Normal	30/30	20/40
105	Normal	25/35	15/45
106	45/15	20/40	Caution
107	40/20	15/45	Caution
108	35/25	Caution	Caution
109	30/30	Caution	Caution
110	15/45	Caution	Caution
111	Caution	Caution	Caution
112	Caution	Caution	Caution

APPENDIX 9: NYRSTAR LOCKOUT PROVISIONS

Roaster Acid Shut – 2019

Lockout Verification Procedure Change Notification

This notice addresses work performed in the planned Roaster Acid Shut – 2024 project and concurrent work. The provisions outlined in this communication are not applicable for any other projects or locations. The standard Lock-out / Tag-out Policy still applies in those cases.

The Changes – “Verifications of Lockout”

All equipment affected by the Roaster Shut Project and concurrent work projects will be locked out using the standard Group Lock Box systems as identified in the established Policy. Each Group Lock Box shall be uniquely numbered and will clearly identify the systems / equipment that it controls.

The Authorized Operator shall apply all required Green locks / tags to each isolation point for all identified equipment, as indicated by the documented equipment lockout procedures. The “Lock-out Tags” shall legibly identify the Authorized person that isolated each lockout point, along with the date of the lockout. All keys to the Green locks shall be placed inside the appropriate Group Lock Box. The Group Lock Box will be securely locked out by the Authorized Operator using the appropriate plant colored Lock-out Device and tag.

Contractors locks will be **BROWN** for easy identification.

APPENDIX 9: NYRSTAR LOCKOUT PROVISIONS

Roaster Acid Shut – 2019

Part #2 Lockout Verification Procedure Change Notification

A second Authorized Person, along with the Authorized Asset Management Representative / Lead Man for this Project, will verify that all equipment and systems isolated under the Group Lock Boxes are correctly locked out and zero energy is verified. Both of these people will sign and date the red “Isolation Certification Tag” and use it to attach their personal lockout devices to the appropriate Group Lock Box for the identified equipment. The initial Operations and Asset Management locks applied at verification will remain on for the duration of the work. The Lockout(s) performed by the Asset Management Representative / Lead Man will serve as isolation verification for all subsequent Maintainers and Contractors that will perform work / service on the isolated equipment. These groups shall utilize separate multi hasp devices to denote Nyrstar Maintenance and Contractor personnel, attached to the Lead Man’s verification multi hasp device.

When the Maintenance / Contractor crew arrives at the job site to perform the work, the Authorized Operator will show them the correct Lockbox for the equipment that is to be worked on. Each person working on the equipment shall affix their personal Lock-out Devices and tags to the Group Lock Box as instructed by the Authorized Operator. The Authorized Operator will then authorize the Safe Work Permit for the task. Additional personnel joining the work crew will add their personal Lock-out Device to the Group Lock Box. No additional verification is required.

Normal procedure will be utilized for the removal of all crew and personal locks. No other aspects of the Lock-out / Tag-out Safety Policy are affected by this change.

QUESTIONS?

Please reach out to the Nyrstar
Safety Department at any time.

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