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SMG
SAFETY MANAGEMENT GROUP

Shutdown/Turnaround HSE Planning

Phone: (317) 873-5064 • **Fax:** (317) 873-5096
8335 Keystone Crossing, Suite 103, Indianapolis, IN 46240
SafetyManagementGroup.com

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Introduction

Indiana State University

<u>Background:</u>
Schooling:
BS – Safety Management from ISU
MS – Occupational Health and Safety from ISU

CHST
ASP

<u>Certifications:</u>
CHST
ASP
Executive Leadership Certification from ASSP

<u>Work History:</u>
Marathon Oil – Robinson, IL (2yrs.)
TRW Automotive – Marshall, IL (5 yrs.)
Safety Management Group – Indianapolis (12+ yrs.)
OCIP Program Management

MARATHON
TRW
SMG SAFETY MANAGEMENT GROUP

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Objectives

- Define a shutdown/turnaround/outage
- What makes these activities unique
- Why do we plan
- Overall Project Planning
- Specific HSE Planning

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Why are we talking about this?

- Shutdown/turnarounds are essential for all types of industries.
- They help keep the process(s) running, ensure that equipment is in good condition, and ensure their process is running as efficiently as possible.

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Definition

A planned/scheduled event where a plant is stopped to perform maintenance, repair, overhaul, upgrades, and/or construction activities over a specified amount of time. Depending on the type of work needed these events can last for as little as a few days to an extended period of time.

Industry Terms:

- Outage is the term used in power plants
- Turnaround is the term used for planned break in production (refining)
- Shutdown – disruption of the process

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What makes these situations unique?

- Increased workforce who may not be familiar with your company's:
  - Rules/Procedures
  - Facility
  - Safety Culture
  - Expectations/outcome
- Extended hours/shifts
- Scheduling constraints (a lot done in a short time)
- They are NOT normal working conditions, they can be dangerous, costly, time-consuming.

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1. Tesoro Martinez Refinery Sulfuric Acid Spill

In early 2014, there were two incidents of sulfuric acid release, which caused worker injuries in the Alkylation Unit of the Tesoro Martinez Refinery. The first incident resulted in a release of 84,000 pounds of sulfuric acid and caused burns to two employees with the potential for far more severe consequences. The second resulted in a spray of acid that injured an additional two workers.

Alkylation units contain both highly aggressive acid catalysts and light hydrocarbons, creating a combination of hazards with the potential for severe consequences. Both incidents at the Tesoro refinery occurred during the performance of non-routine maintenance work.

The investigation report highlights the inherent increase in risk when conducting work that is unfamiliar and where procedures and work instructions may not be well known and understood.

Detailed planning and risk assessments are absolutely essential when conducting non-routine work. A highly-structured planning process will lead to appropriate questions being asked and answered regarding the work steps required and the risks at each stage.

A multi-disciplinary team has the best chance to properly prepare for the work and minimize the risk to employees.

https://www.prometheusgroup.com/posts/critical-maintenance-lessons-from-5-major-recent-oil-industry-accidents

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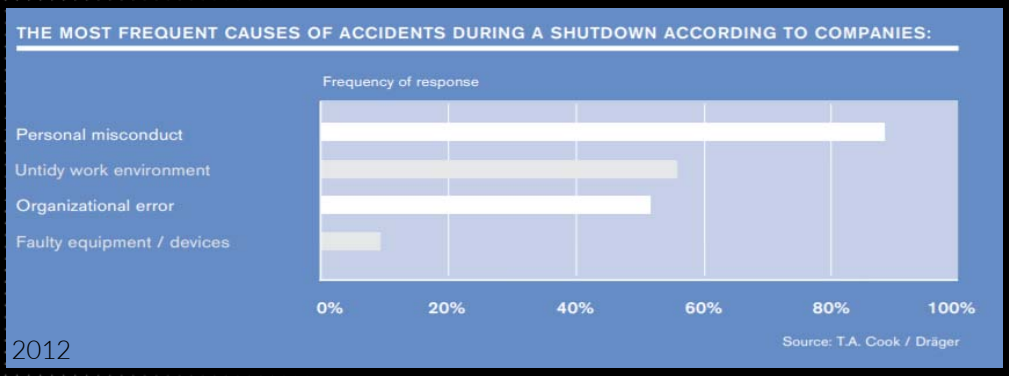
Accidents during a shutdown

Per the CSB (Chemical Safety Board) – 37% of incidents they investigate occur prior to, during, or immediately following maintenance work. (www.csb.gov)



https://www.draeger.com/library/content/safety-cs-999-en.pdf

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Why it's important to plan

With well-trained and equipped personnel it is possible to manage any shutdown safely and smoothly.

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Project Overview

It takes a team of people to plan, execute, and deliver a shutdown/turnaround project. This includes:

- Engineering
- Maintenance
- Leadership
- Environmental Health & Safety (EHS)
- General Contractor(s)
- Almost all aspects of the business are in some way involved

As an EHS professional it is our job to get involved:

- The sooner the better – As soon as the last turnaround was completed ☺
- Develop relationships with those planning these events
- Communicate safety requirements to all involved
- Attend planning meetings
- Strong understanding of the work and schedule
  - Know and understand the procedures that will be used for shutdown, construction practices for work and the bringing back on line. The who/what/when/where/why/….

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Contractors

- Most shutdown/turnarounds require a great deal of contractors to complete the work in the timeframe allotted. The contractors will need to know the following:
  - Orientation
  - Site rules/requirements (Smoking? Cell Phone use?)
  - Facilities layout
    - Parking
    - Siting of equipment, materials, tools, etc.
  - Expectations
  - Any additional training requirements

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Plan the Work

Work the Plan

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Communication

Communication is the key!!

- As EHS professionals we can be the conduit between all levels.
  - We can help communicate the HSE requirements
  - We need to ensure that the EHS policies/procedures are followed
  - We need to establish relationships with all involved
  - Participate in any teams, updates, meetings, and other discussions
    - Daily updated meetings

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Planning

- I've found that good planning upfront helps mitigate issues during all the chaos and long hours of a project.
- A written document helps to keep everything and everyone on the "same page."
  - Assists with documenting agreements/expectations
  - Helps clearly communicate requirements and expectations to EVERYONE involved

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Things to Consider

When writing a safety plan consider including the following:

- Scope of Work/Purpose/Goals
- Roles/Responsibilities/Support
- Safe Work Practices & Hazard Identification
- Training/Orientation
- HSE Requirements/Communication
- Observations
- Recognition
- Incident Management
- Environmental Requirements
- Emergency Preparedness (i.e. Fire, Weather, etc.)
- Health Surveillance

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Scope of Work/Purpose/Goals

- The amount of detail needed depends on how this plan will be used. It can be used as:
  - Very detailed/specific
  - Project specific
  - Safety only focus
  - Communication document to contractors

- When deciding how to use the document, at a minimum include the scope of work. Be specific on what exactly this plan covers.

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Roles/Responsibilities/Support

- Roles and responsibilities help communicate who the ultimate decision makers in the organization are and how everything fits together.
  - Can show management involvement
  - Use names to be specific on who owns or supports what activities
  - Assists contractors
- Roles and responsibilities may NOT be effective in every situation.
  - An organization chart may be enough
  - **This is very helpful for the contractor workforce**

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Safe Work Practices

Outline what tools are available for safe practices and outline expectations to keep safety front and center.

Ideas:

- Set the expectation that every meeting has a "safety moment".
- Outline daily safety requirements and planning
  - Including any permitting
- Safety Observation Reports (SOR's) or electronic observation tracking system.
- Remind them to stay within their personal limits
- Green Vest Person

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HSE Requirements/Communication

This is the most important part of the document.

- Outlines requirements for performing tasks

Consider covering the following topics as they apply to your specific needs:

- Aerial Work Platforms
- Barricading
- Confined Space
- Electrical Safety
- Environmental Requirements
- Fall Protection
- Haz Com
- Housekeeping
- LOTO
- Permits
- PPE
- Scaffolding
- Walking Working Surfaces

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HSE Requirements (cont.)

Aerial Work Platforms

- Require a spotter when moving or using equipment
- Spotter requirements for operating in an emergency situation

Barricading

- What situations require
  - Tape i.e. caution or danger tape
  - Cones
  - Jersey Barriers
  - Signage

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HSE Requirements (cont.)

Confined Space

- What additional requirements do you require outside of the "normal" OSHA specifics.

Electrical Safety

- Energized Electrical Work
- Electrically Classified Areas
- GFCI requirement

Environmental

- Waste Management
  - Dumpsters, roll offs, metals only, haz waste, etc.
  - Company specific requirements
  - Spill or release requirements

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HSE Requirements (cont.)

Fall Protection

- What additional requirements do you require outside of the "normal" OSHA specifics?
- Tasks that requires retractable or double lanyards
- First Man Up

Gang Boxes

- Any hazards present by using them?

HazCom

- Outline the specifics of your environment
  - What chemicals are allowed? SDSs available?
  - Dumpsters, roll offs, metals only, haz waste, etc.
  - Company specific requirements
  - Spill or release requirements

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HSE Requirements (cont.)

Housekeeping

- Expectations
- Slip, Trips, and Falls

LOTO

- Lockbox/lock expectations
- Requirements, walkdowns, permits, signatures

Permits

- What permits are required to perform work
  - Hot Work
  - Safe Work
  - Line Breaking
  - Confined Space Entry
  - Energized Electrical
  - LOTO

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HSE Requirements (cont.)

Other things to consider:

- Fatigue Management
- Fit for Duty (i.e. drug/alcohol testing, random, for cause, etc.)
- Health Surveillance (i.e. Asbestos, Benzene, Hearing, etc.)
- Contractor/Sub requirements (Qualification, proof of training)
- Gowning/Cleanliness Requirements
- Bugs, Bird, or Wildlife Requirements
- Rules for accessing the roof

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Incident Reporting

Reporting

- Types of reports required (near miss, injury, SIF, etc.)
  - Is it different for contractors?
- Who to contact, notification tree
- Onsite nurse or medical staff?
- Off site preferred provider?
- Ambulance/Fire Services
- What actions require further investigation (i.e. RCA)
- Will metrics be run off the data collected, what do you want to measure?

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Emergency Response

Possible Events

- Fires
- Major Health Event
- Accidental Release/Major Spill
- Hostile Intruder
- Bomb Threat
- Power Loss
- Aerial/CSE Retrieval

Weather and Natural Events:

- Lightning
- Thunderstorms
- Tornados
- Earthquakes
- Floods

"Regular" methods may not work

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Observations/Walk Throughs

- Involve as many people/positions as possible, more eyes the better.
  - Required daily/weekly?
  - Is there a "quota"?
  - Will they be tracked?

- Pre and Post walkdowns of work
- Specific documentation/database

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Recognition

This is optional – Should be positive

- This could be very easy or very complex
  - Fan of the KISS model
- Usually it is some type of recognition program that will highlight the effort and safe practices of those working on the project.
  - This could include:
    - "Thank you" meal provided by the primary company
    - Gift cards given for safe work or finding hazards
- Used as a way to engage employees and keep safety at the forefront.

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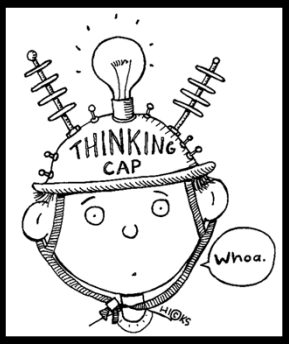
Additional Considerations

Share site maps

Create a phone list

Incident Flow Chart

Reference specific programs/SOPs



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Now What?

We have covered a lot of information with several ideas and considerations. Now what?

- I prefer a written document, single source of info that can be shared and referenced
- Contents need to be communicated to EVERYONE associated with the work
  - Orientation/Training
- Highly suggest a daily update meetings during work

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Summary

Information overload with lots to consider

Planning is worth the time invested

The safety of everyone is the top priority

Everyone should go home safely after every shift

Communication is crucial!!

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Thank you!

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