USE PLANT WALKTHROUGHS TO ENHANCE PROCESS SAFETY RISK DISCOVERY

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A SABIC and CTE Joint Venture

CONTENTS

- INTRODUCTION

  PROCESS SAFETY AND PERSONAL SAFETY

  PROCESS SAFETY VS PERSONAL SAFETY

WHAT IS PROCESS SAFETY TO YOU?

Personal Safety

Personal Safety Protecting against personal injuries
Slips, trips, falls, etc.

Process Safety

Process Safety is a blend of engineering and management skills focused on preventing catastrophic accidents, particularly explosions, fires, and toxic releases

PERSONAL SAFETY VS PROCESS SAFETY

Personal Safety	Process Safety
Frequent	
Higher frequency occurrences	Lower frequency occurrences
What does it prevent?	
Health and safety issue related to trips, slips, falls, exposure to chemicals, noise, etc resulting hart at an individual level.	Unintentional releases of chemicals and energy leading to major event with big consequences (toxic releases, fires, explosions, pollution)
Who does it protect?	
Workers	Workers, public, business, environment.
What does it try to act on?	
Individuals' behavior, Management systems.	System design (Processes, Equipment), Management systems, Individuals behavior.
How Difficult is it to grasp?	
Easier to understand (not mean easy to implemented).	Requires complex engineering and multidisciplinary knowledge.

- PURPOSE OF PS WALKTHROUGH PROGRAM

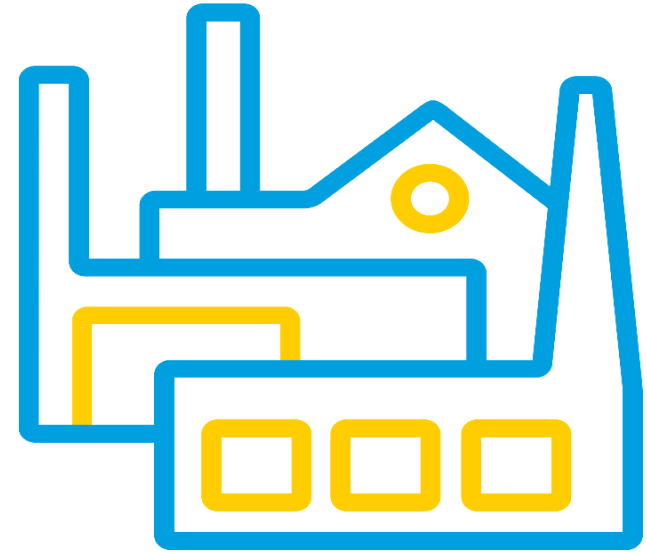
THE PURPOSE OF PS WALKTHROUGH PROGRAM

- To identify hidden process safety (PS) risks.
- To ensure an effective system exists to manage PS Walkthrough which will help in ensuring strength of the protection barriers or through procedures.
- To establish guidelines for carrying out PS Walkthrough by using pre-defined checklists.
- To assign responsibilities for effective implementation the system.
- To do analysis of the findings from PS Walkthrough and investigate common causes and recommendation to ensure the findings will not be repeated.

THE PURPOSE OF PS WALKTHROUGH PROGRAM

Scope

This program defines requirements for PS Walkthrough activity for all the process plants, storage and utilities



Expected results

- Zero overdue of PS Walkthrough rounds.
- Zero overdue of PS Walkthrough finding actions.

- **1. FREQUENCY & TEAM COMPOSITION OF PS WALKTHROUGH ROUNDS**

  2. RESPONSIBILITIES

FREQUENCY & TEAM COMPOSITION OF PS WALKTHROUGH ROUNDS

Weekly

- One PS Walkthrough Round should be conducted Weekly .
- Each shift will be responsible to conduct 4 rounds per month.
- The team members should be as following:
  - Plant specialist or shift supervisor.
  - Minimum two operator.

Quarterly

- Executive shall have a quarterly rounds to cover Process Safety Walkthrough checklists as following:
  - 1 rounds by GMT and one by GMO.
  - 1 round by Vise President, and
  - 1 round by President.
- The team members should be as following:
  - Operation/ TSD/ EHSS/ maintenance Sr. Mangers.
  - Process safety engineer.
  - Plant specialist/shift supervisor or Production Engineer.

Monthly

- One PS Walkthrough Round should be conducted monthly.
- Operation Sr. Manger Shall lead at least 6 PS Walkthrough rounds per year and may assign 6 by Operation manger.
- The team members should be as following:
  - Manager (Inspection/process/rotating/ safety).
  - Plant specialist or shift supervisor or Production Engineer.
  - Process safety engineer
  - Inspection Engineer
  - Safety Engineer or specialist.
  - Electrical/ Instrument engineers (as required).
  - Minimum one operator.

RESPONSIBILITIES

1 **PS Focal Point (PS Engineer)** | 2 Operation Manager | 3 Operation Sr.Manager | 4 Rounds Leader

- Develops and issue annual PS Walkthrough schedule for each plant
- To ensure that PS Walkthrough are conducted as per schedule.
- Provide PS Walkthrough status to EHSS Steering committee on monthly basis
- Carry out the analysis of all the findings on annual basis.
- Shall conduct PS Walkthrough awareness when needed.
- Shall ensure that PS Walkthrough process is effective and improved continuously.

RESPONSIBILITIES

1 PS Focal Point (PS Engineer)

2 Operation Manager

3 Operation Sr.Manager

4 Rounds Leader

- Shall ensure that PS Walkthrough are conducted for his unit as per schedule.
- Shall track unit level actions of findings of all PS Walkthrough and assign those actions to concerned/required disciplines.
- Shall provide status of actions to PS Walkthrough Focal Point on monthly basis.

RESPONSIBILITIES

1 PS Focal Point (PS Engineer)

2 Operation Manager

3 Operation Sr. Managers

4 Rounds Leader

- Ensure effective implementation of the system.
- Lead the related PS Walkthrough for 12 rounds per year.
- May assign 6 PS Walkthrough rounds per year out of 12 to be led by operation manager.

RESPONSIBILITIES

1 PS Focal Point (PS Engineer)

2 Operation Manager

3 Operation Sr.Managers

4 Rounds Leader

- Prepare PS Walkthrough by:
  - Review previous PS Walkthrough check list findings and Record PS Walkthrough team findings on master hard copy
  - Issue draft soft copy of filled PS Walkthrough checklist for comments and corrections to the team.
  - Issue soft copy of filled PS Walkthrough checklist to Unit Operations Manager and PS focal point for tracking purpose.

EXAMPLE PROGRAM SCHEDULE

Action	Target	BY	Remarks
Create PS walkthrough check list	• July 2016	• PS Engineers	
Issue PS walkthrough procedure	• July 2016	• PS Engineers	
Conduct PS Walkthrough awareness to concern members.	• July/August	• PS Engineers	
Conduct Pilot PS walkthrough	• August 2016	• PS Engineers + Team	
Lunching PS walkthrough program and conduct first PS walkthrough	• End of August	• Management	

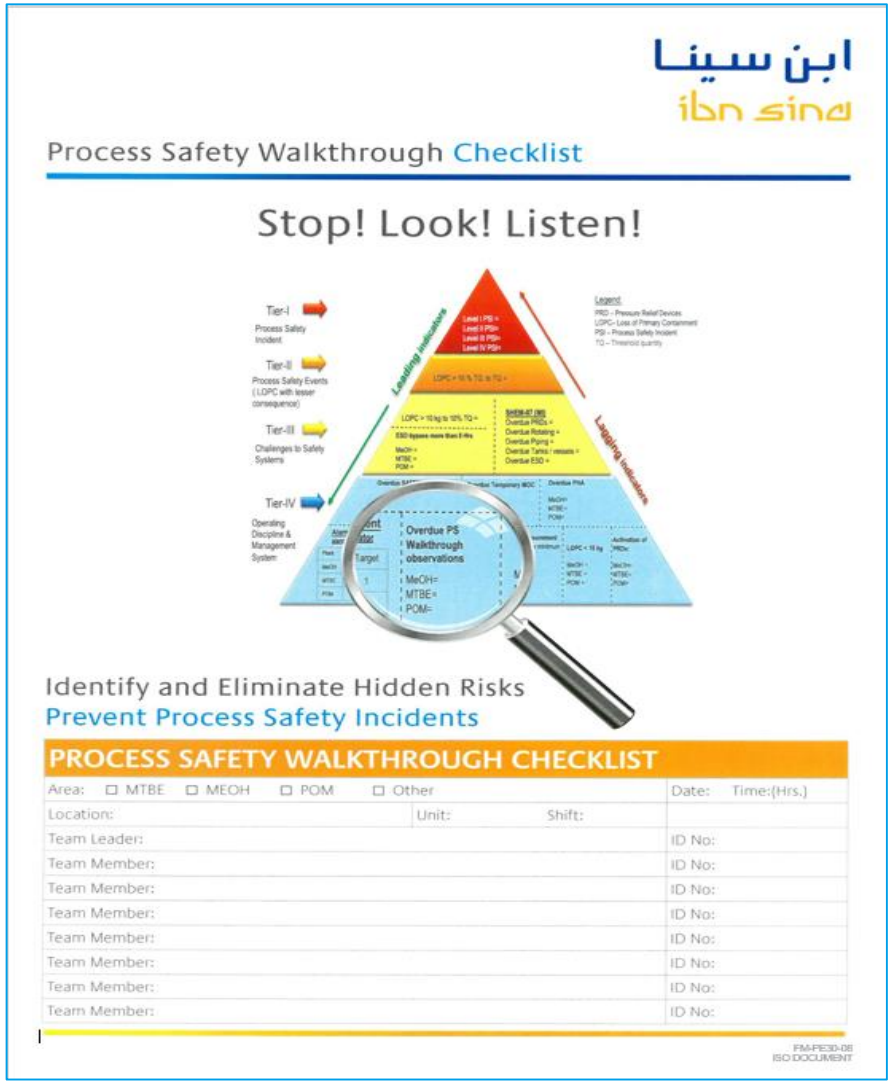
- PS WALKTHROUGH CHECKLIST

PS WALKTHROUGH CHECKLIST

- The PS walkthrough check list divided into sections for key topics (examples following):

1. SAFETY, HEALTH AND FIRE PROTECTION	2. SAFETY & RELIEF FACILITIES	3. PIPING, VALVES, VESSELS AND FURNACES
4. PUMPS / COMPRESSORS	5. WASTER STREAM, ENVOIRONMENT, UTILITY SYSTEMS, TANKS	6. HOSES

EXAMPLE PS WALKTHROUGH CHECKLIST



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Process Safety Walkthrough Checklist

Stop! Look! Listen!

Identify and Eliminate Hidden Risks
Prevent Process Safety Incidents

PROCESS SAFETY WALKTHROUGH CHECKLIST

Area: ☐ MTBE ☐ MEOH ☐ POM ☐ Other			Date: Time:(Hrs.)
Location:	Unit:	Shift:	
Team Leader:			ID No:
Team Member:			ID No:
Team Member:			ID No:
Team Member:			ID No:
Team Member:			ID No:
Team Member:			ID No:
Team Member:			ID No:
Team Member:			ID No:

FM-PE30-08
ISO DOCUMENT

ITEMS	CHECK ITEMS	REMARKS
A	SAFETY, HEALTH AND FIRE PROTECTION	
1	Are process sight glasses, flow indicators, gauges, etc. in good condition and reliable	
2	Do sighs adequately identify work are hazards and equipment provided?	
3	Is unobstructed access to safety and fire protection equipment provided?	
B	SAFETY & RELIEF FACILITIES	
1	Is there signs of corrosion in the body of the PSV?	
2	Is there sign of passing PSV?	
3	Is safety valve inlet and outlet piping properly supported?	
4	Is atmospheric safety valve provided with weep (drain) hole at bottom?	
5	Have you observed PSV chattering (Rapid opening and closing of PRV)?	
6	Are all flare tips pilots ignited?	
7	Is flare base water level within normal range?	
C	PIPING, VALVES, VESSELS AND FURNACES	
1	Have you noticed crack or leak in piping?	
2	Have you noticed Damage insulation?	
3	Have you noticed any hot spot in piping?	
4	Is there missing or damaged plug or cap in pipe connections?	
5	Is there pool support piping?	
6	Is there signs of vent pluggage?	
7	Is there missing or damaged car seal?	
8	Is there proper support to the temporary clamp?	
9	Is there sign of leak from temporary clamp?	
10	Are vents and drains located such that they do not create personnel hazards?	
11	Are sample points property configured for safe sampling?	
12	Do you notice abnormal flame shape?	
13	LABELLING: Have lines been clearly labelled, including flow arrows (special attention for battery limit isolation valve)? Have vessels been properly labelled?	
D	PUMPS / COMPRESSORS	
1	Is there liquid around the pump? What type of liquid?	
2	Is there abnormal sound from pump?	
3	Is there enough fluid in the reservoir (seal plot) and is it flowing to the pump?	
4	Do you notice hot motor surfaces that could be an ignition source?	
5	Is there evidence of pump seal leak? Is there enough level in the seal pot? Check pressure and flow indications.	
E	WASTER STREAM, ENVOIRONMENT, UTILITY SYSTEMS, TANKS & STORAGE	
1	Have you noticed any damage in secondary containment (dike)?	
2	Have dinking isolation valves been closed?	
3	Do you observe any sign of corrosion or leak from bottom of storage tank?	
4	Do you notice waste is properly segregated and labelled?	
5	Do you notice any smoke from flare or furnaces or boilers?	
F	HOSES	
1	Is there signs of corrosion or hose leak?	
2	Are the seals (gasket or O-rings) in good condition?	
3	Is the hose provided with valid inspection tag?	
4	Is there a hose improper support?	
5	Is proper type of hose used?	
6	Are there utility or process hoses without non return valve/	
7	Are there temporary hoses connected to process equipment w/o proper approval/temporary MOC (hoses used for wrong service)?	

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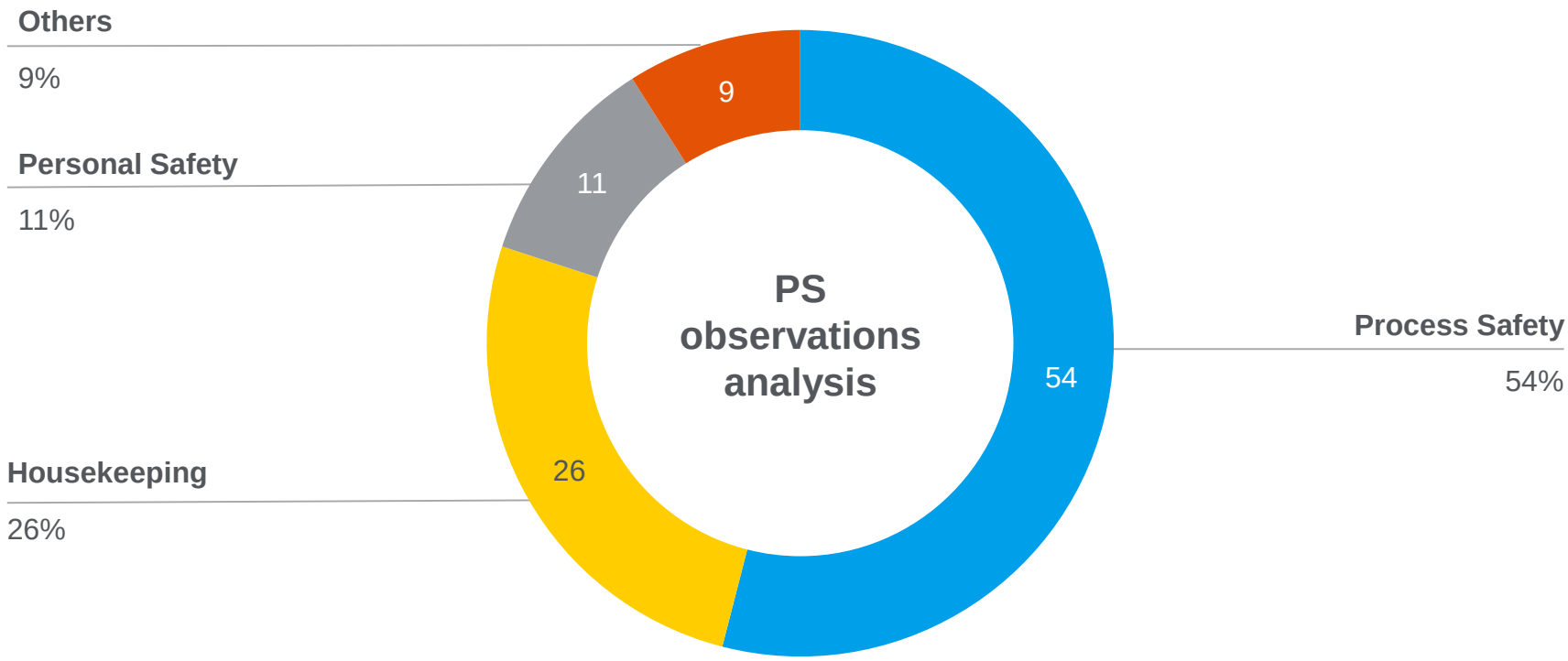
- ANALYSIS OF THE FINDINGS

PROCESS SAFETY WALKTHROUGH EXAMPLE ANALYSIS



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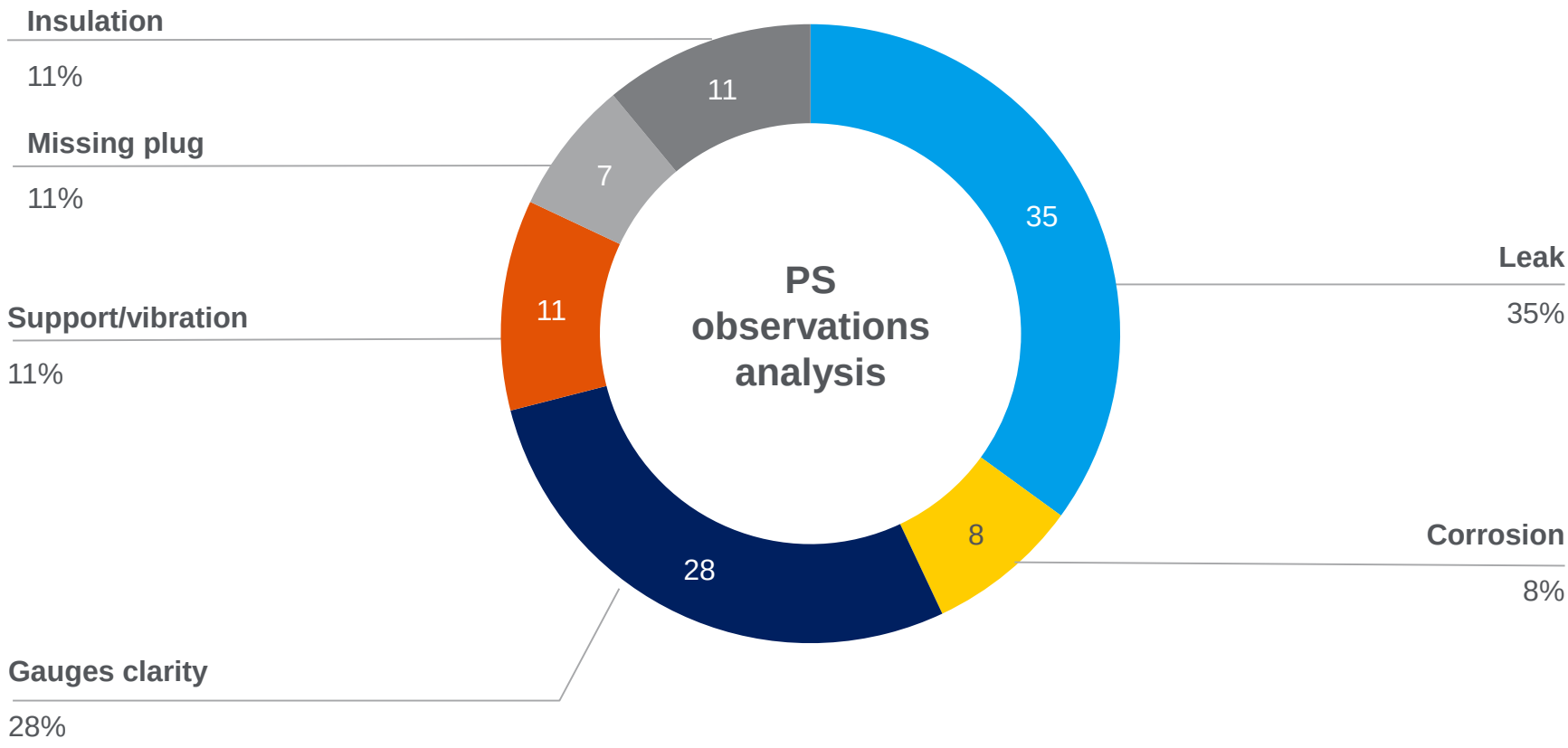

EXAMPLE FINDINGS FROM PS WALKTHROUGH

PLANT #1

- Dusty sight glasses, flow indicators, gauges.
- Unreliable pressure gauges.
- PSV's have hole in the bottom of the discharge pipe plugged.
- Figure 8 blind for HE-xxx in the wrong position (open position instead of close position).

PLANT #2

- Equalizer valve of PV-xxx has pinhole leak.
- MeOH leak in the new clamp installed in HE-xxx.
- Observed CO leak on the isolation valve downstream of UV-xxx.
- PSV observed dripping
- Air House used for oil service.
- Cracks found in tank farm area outside and inside Dikes.

PICTURES

Lunching PS walkthrough program

Recognition by executive management for best PS finding

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Thank You

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