Behaviour Based Safety Observation - STEP

• In 2017 Scotford moved program from a compliance focus to a quality focus – Quality over Quantity

• Observation quality is determined by:
  • Evidence of an interaction
  • Specifics about the interaction and the behaviour observed
  • Why the person chose to perform the task in the manner they did
  • Evidence of review of all aspects of the task

Goal is to have 80%+ quality observations
Scotford Behaviour Based Safety Trending

With the data we track “At risk vs Safe. During Turnaround

The closer the lines come together, the higher the risk of incident in this area. Crossed lines indicate imminent danger for incident.

Top Three Risks:
1. Vehicle Use
2. Line of Fire
3. Use and Storage at Heights

Correlation to actual site incidents:
- 4 motor vehicle incidents
- 1 recordable hand injury related to line of fire
- 1 dropped object

Top Three Risks:
1. Use and Storage at Heights
2. Line of Fire
3. Vehicle Use

Correlation to actual site incidents:
- 4 dropped objects
- 1 line of fire recordables
- 2 motor vehicle incidents
Behaviour Based Safety Observation - STEP

• Seeing clear correlations - how to we use this to prevent future incidents?

• Quick response & interventions – within 24 hours
  • Changing Toolbox talks to at risk areas
  • Take message & data down to front line
  • Briefing Permit Issuers of at risk areas - change/increase barriers
  • Brief Adopt a Crew Coaches – take personal message into crews
  • Revisit close the loop cards for different areas
COAA Safety Moment
Smart Torque System (STS)

- Integrated flange management system
- Cloud-based data management platform connected to a tablet computer and a Bluetooth-enabled digital torque wrench
- Real-time data tracking and automatic record keeping of flange management activities
- Goal: Leak free start-ups
- Demonstrate value of STS data to Scotford maintenance and turnaround teams
- Confirmability of STS to integrate into Scotford’s flange management procedures & database
- Demonstrate ability of fitters to quickly learn and adapt to STS
STS reduces overall flange management time

### Non-STS TFA Process
- **Flange Identification**
- **Data Calculation**
- **Flange Tagging**
- **TFA (Torque, QC)**
- **Shell QA**
- **TFA Data Aggregation**
- **Unit Startup**

### Initial Implementation
- **Flange Identification**
- **Data Calculation**
- **Flange Tagging**
- **TFA (Torque, QC)**
- **Shell QA**
- **Unit Startup**

### Subsequent Uses
- **Flange Tagging**
- **TFA (Torque, QC, Shell QA)**
- **Unit Startup**

- Data aggregated w/in STS database/dashboard – No post processing
- Reduced Shell QA – Data presented (w/pictures of work) on dashboard
- Flange ID and data calculations reduced – Complete historical record of each flange

Better Data, Better QA, Better HSSE Outcomes
What went well

- Fitters were trained “on the go” and able to use the tools in less than one hour
- Fitters who were initially skeptical saw value in the system once they started using it
  - E.g., one fitter called the system a “game changer”
- Site-specific procedures and conditions were identified for future deployments
- Identified incorrect data for a gasket in the flange database. This is now flagged for correction.
- Learned that the average torque time for a 6” flange at Scotford is 24 minutes vs. 32 minutes at Bukom
STS provides contractor performance transparency

- STS provides facility managers detailed, near-real time contractor performance data
  - Torque-time per flange
  - Rework
  - Delay between completion and QC

- This data can aid in the selection of appropriate contractors and provide performance benchmarking

- The value of the data set will grow exponentially over time

Data from March 2017 Jurong Island Turnaround

Data from October 2017 Scotford Pilot