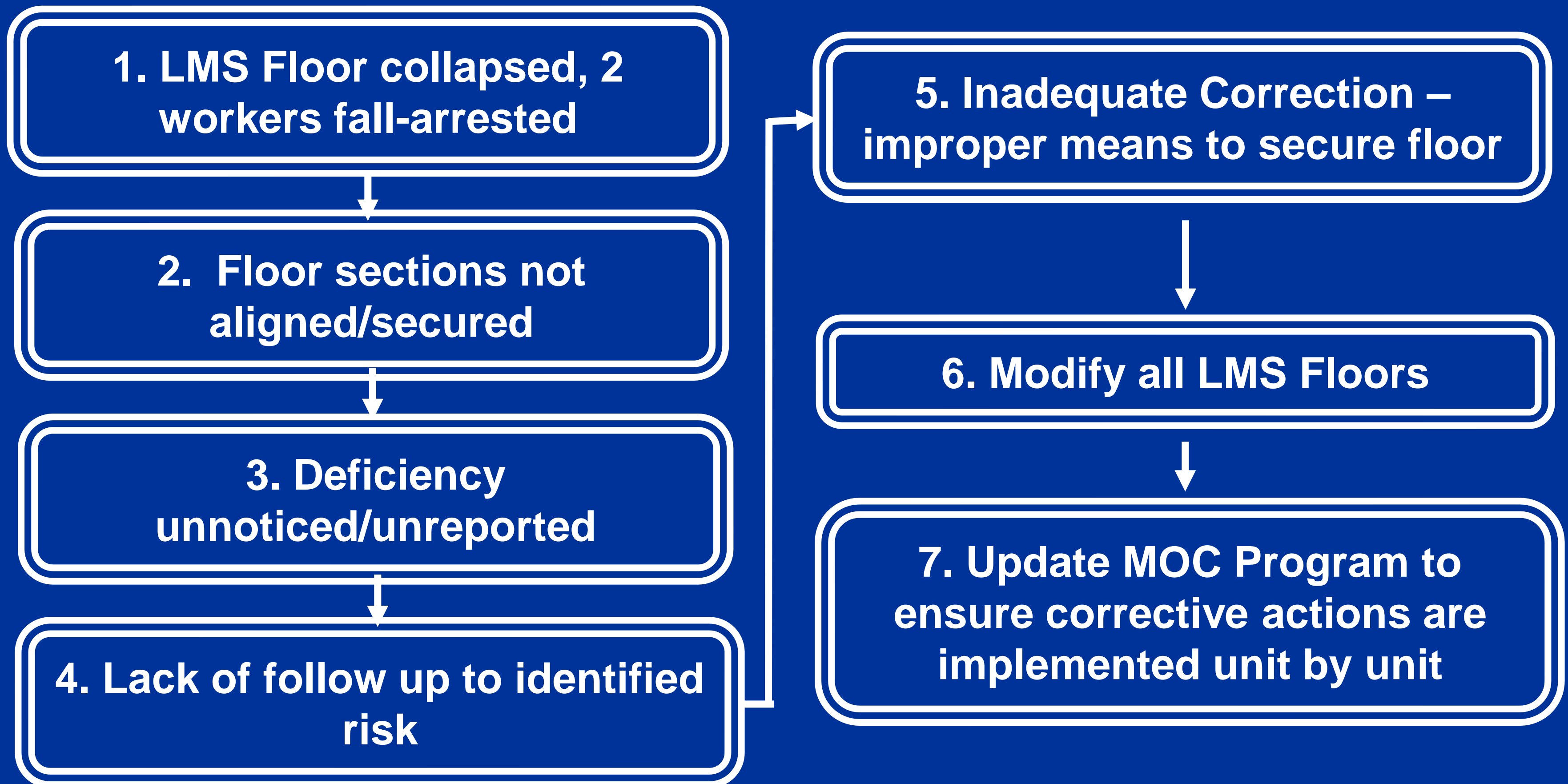
HIGH ARCTIC
ENERGY SERVICES

Sequence Of Events



What Happened…

- A snubbing crew was assembling the BOP stack and preparing to place the snubbing unit onto the top of the annular. The BOP stack is equipped with a Load Manager (sub structure) and a temporary work floor to access the connection. The 4 floor sections atop the LMS legs are designed to be bolted together at all 4 corners to be secured. Tabs in the inside middle secure each section to prevent them from moving on the structure when the entire floor is assembled. However, as the bolt holes did not line up, the crew was using 1" nylon straps to hold the sections together for the past year.

- On the night of the incident, two Snubbing Assistants were standing on the floor to guide the snubbing unit onto the flange as it was hoisted into position. Two workers were also on the ground using the guy lines to guide the unit. As the men were about to stab the unit onto the annular, one of the Assistants pushed on the unit, using the handrail for leverage. The extra strain on the strap holding the floor sections together caused it to fail. The section that the two Assistants were standing on became dislodged and collapsed under them, causing them to lose footing. The Assistants were tied off using climbing harnesses and lanyards as the LMS handrails do not fully enclose the area. The harnesses and lanyards arrested their fall and protected them from falling 5 meters to the ground.

Floor Added to Original Design in 2006

- Sections pinned at corners
- Securement is dependant on all 4 sections being installed
- Sections are not fastened to the LMS legs

Modifications in March 2011 – Post Incident

- Sections can be clamped to the LMS leg
- Individual sections can be secured
- A redundant tab is additionally securing the sections to the middle of the structure

Investigation…

Investigation Team Charter

- Chris Anderson dispatched Ross Whelan to location to investigate the incident.
- The Kelvin TOPSET methodology was used to develop the causal analysis.
- The investigation included a visual inspection of the LMS on site and other LMS's in the Red Deer yard, and a review of a similar incident in 2009. The Supervisors and crew were interviewed at location. The HAES welding Foreman and the Equipment Support Manager were also involved.

Why did it happen...

The incident occurred because the LMS was not sufficiently evaluated for operational readiness during the design and fabrication phases. A working surface was never initially designed to be an integral part of the LMS.

The previous incident highlighted the need to secure all 4 sections together. An Alert was issued to ensure awareness, and a JSA was developed. Although the Alert had been closed off and the Supervisor was aware of the requirement, the bolt hole alignment prevented the ability to comply with the assigned corrective action which was not reported, and there were no follow up activities to ensure compliance.

Contributing Factors...

The Supervisor failed to ensure the deficiency was corrected.

Management failed to identify the deficiency during field visits.

Management failed to ensure corrective actions were implemented.

Floor sections were mixed up and incompatible, bolt holes not aligned.

Floor sections not fastened to the LMS.

Root Causes...

Inadequate Design: no means available to fasten the floor to the LMS.

Inadequate Performance / Compliance: Supervisor failed to report and correct nonconforming product (used straps instead).

Inadequate Management of a Change: written instructions not distributed.

Corrective Actions…

A modification to the LMS allows for each section to be individually secured to the LMS structure. JSA issued.

The Supervisor was given a verbal warning to ensure future deficiencies are reported and corrected.

The Weekly Inspection Checklist of critical items will be revised to include LMS inspections.

The MOC Program has been improved to ensure standardization, communication and updated documentation activities are taken as part of changes.

Transferable Learnings...

HSE factors should be considered early in design and development of equipment. Corrections are a process.

All organizations need to rely on people to implement corrective actions in response to incidents.