



RP 12.0: INSPECTION OF CATWALKS

A Recommended Practice (RP) for the
Canadian Land-Based Drilling

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CANADIAN ASSOCIATION OF OILWELL DRILLING CONTRACTORS
RECOMMENDED PRACTICE 12.0
INSPECTION OF CATWALKS (DR)

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INTRODUCTION

The Canadian Association of Oilwell Drilling Contractors (CAODC) Engineering & Technical (E&T) Committee has developed a Recommended Practice (RP) for catwalks. This document dated October 2016 supersedes all prior editions of this Recommended Practice.

The information contained herein is a recommendation only of inspection schedules for catwalks currently utilized in the Canadian drilling industry. An attempt has been made to establish some practical recommended operating practices for catwalk equipment in the Canadian drilling industry.

The recommendations contained in this document should be considered in conjunction with the requirements of the original equipment manufacturers (OEM). Companies should operate and maintain the equipment within the operating limitations, such as load ratings, as designed by the OEM.

If the OEM stipulates increased levels of inspection or accelerated inspection/certification cycles, the contractors must follow the OEM guidelines unless granted approval to follow this CAODC Recommended Practice by a Professional Engineer (P. Eng).

CAODC has produced this Recommended Practice based on industry experience. However, this document should be considered in conjunction with all relevant legislation and the requirements of provincial regulatory authorities. This document should not be construed as a legal opinion, and users are advised to seek legal counsel to address their specific facts and circumstances.

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RANGE OF OBLIGATION

Throughout this RP the terms 'must', 'shall', 'should', 'may', and 'can' are used as indicated below:

| TERM | USAGE |
|------|--|
| MUST | A specific or general regulatory and/or legal requirement that must be followed. |

| | |
|--------|--|
| SHALL | An accepted industry practice or provision that the reader is obliged to satisfy to comply with this RP. |
| SHOULD | A recommendation or action that is advised. |
| MAY | An option or action that is permissible within the limits of the RP. |
| CAN | Possibility or capability. |

HISTORY

Powered catwalks were originally conceived to eliminate risk to CAODC rig crew members during traditional laydown or pick up operations and enhance the service offerings of CAODC member companies. Since 1995, the invention and adoption of powered tubular handling equipment has almost completely replaced the traditional drilling rig catwalk.

Manufacturers of powered catwalks have come from a variety of backgrounds including drilling contractors, small boutique welding shops, engineering companies and multi-national rig supply corporations. Catwalks have been supplied in “custom” and “one of” configurations as well as mass produced models. In many cases, early manufacturers no longer exist, but their equipment carries on working. While these catwalks were originally conceived to reduce risk, they require proper maintenance techniques and maintenance plans which may or may not be in place today, depending on the owner’s preference and resources available. This Recommended Practice is intended to ensure that a minimum standard of care is taken with respect to catwalk inspection and maintenance.

REVIEW PROCESS

CAODC Recommended Practices are reviewed and revised, reaffirmed, or withdrawn at least every three years. A one-time extension of up to two years may be added to this review cycle. Email any comments or items of concern to rpfeedback@caodc.ca.

RP REVISION SCHEDULE

| Revision Date | Revision Details |
|---------------|---|
| October 2016 | RP released and circulated to CAODC membership. |

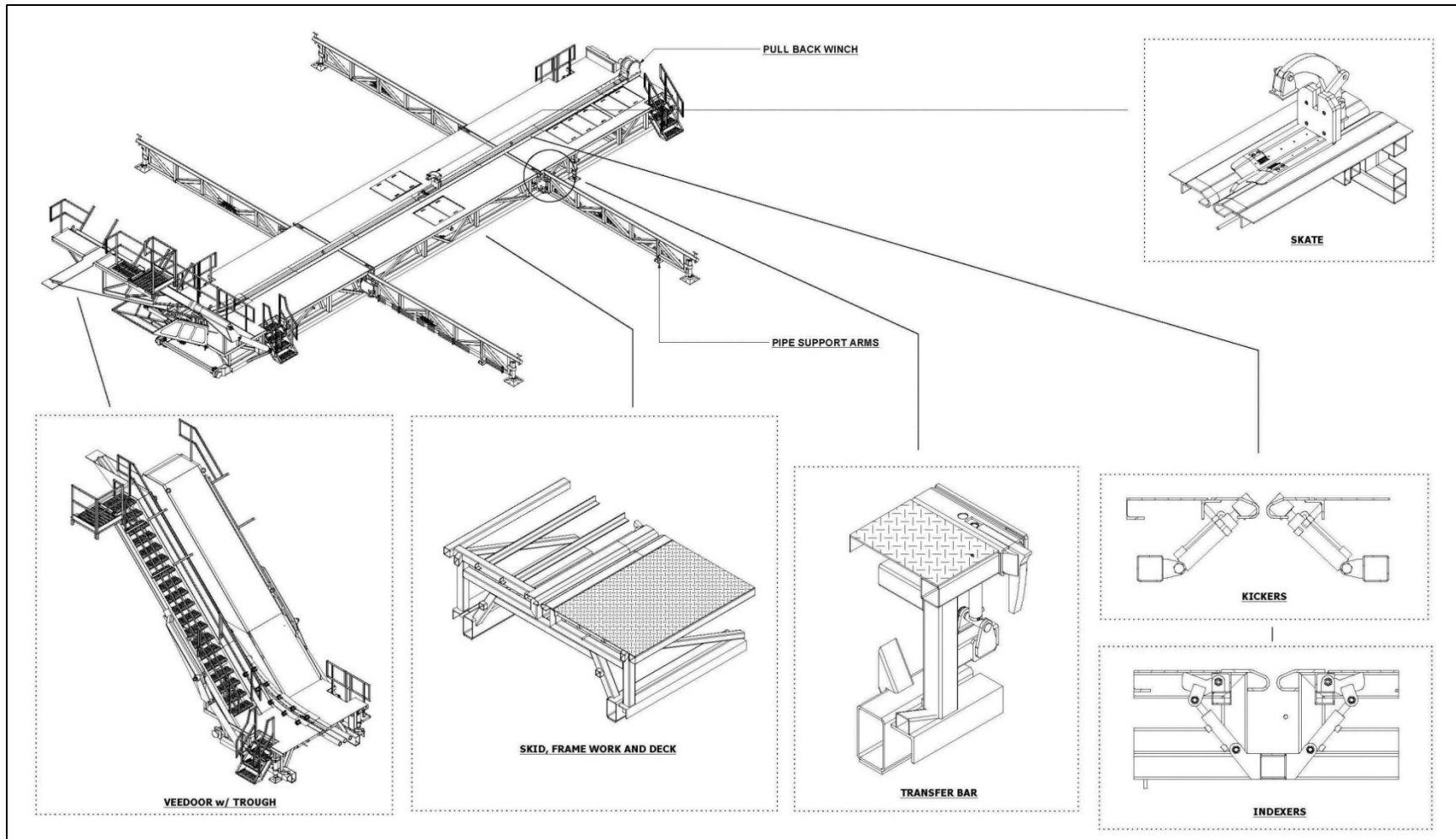
1. **SCOPE – CATWALKS**

For the purposes of this Recommended Practice (RP), all catwalks used on drilling rigs are considered to be powered and/or non-powered. The catwalk components covered in this RP include:

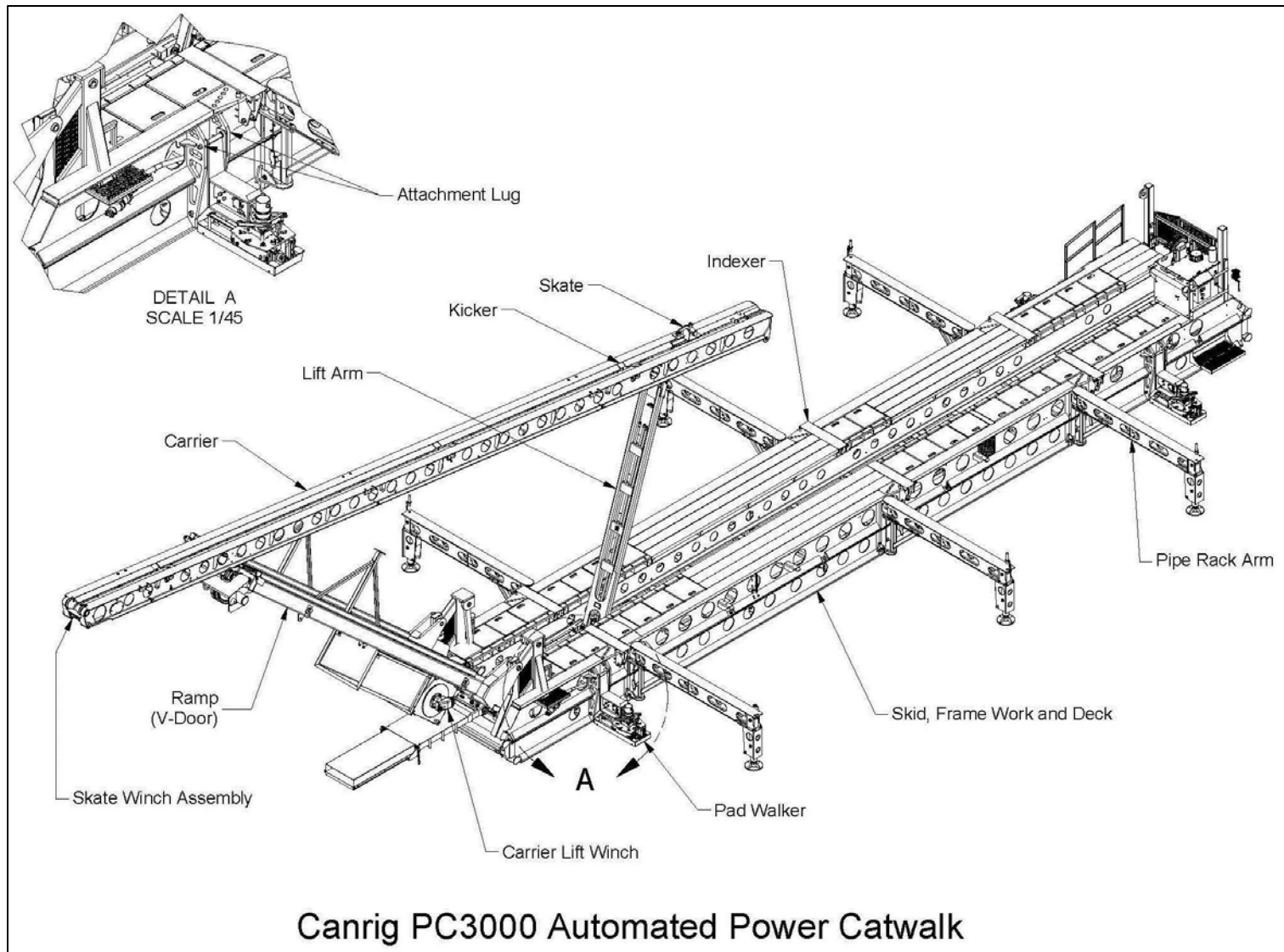
- Catwalk skid, spreaders and framework under the deck;
- Integral V-Doors, including pivot points and attached equipment;
- Pipe transport mechanism(s) (e.g. skates, troughs etc.);
- Pipe loading mechanism(s) (e.g. kickers, indexers, gull wings etc.);
- Casing/drill pipe support arms;
- Decking materials;
- Deck equipment (e.g. tie back posts, pull back winches, etc.);

At this time, the scope of this RP does not include:

- Hydraulic/electric drive motors and pumps;
- Manifold buildings and their contents (other than their structural attachment to the catwalk);
- Manifold lines, tee blocks, or other blowout preventer related equipment;
- Steam lines;
- Hydraulic pipe tubs/tables;
- Alarm and control systems;
- Fall arrest systems;
- Moving systems.



Skate Style Catwalk
(Courtesy of Ja-co Welding and Consulting Ltd.)



(Courtesy of Canrig Drilling Technology Ltd.)

2. **INSPECTION TYPES**

To ensure catwalk components are properly maintained and serviceable, four levels of inspection are recommended:

2.1 **LEVEL I INSPECTION**

A Level I inspection is an observation of the equipment prior to, and/or during operation, and/or during routine maintenance including a visual inspection of:

- All hydraulic cylinder attachment points;
- All pipe supporting arms both at the connection to the catwalk and at the connection to the ground support rod;
- All observable load bearing areas (e.g. trough supports, mounts etc.);
- Ground support for jacks;
- Decking materials, equipment mounts and retainers:
 - Replace worn and/or damaged boards;
 - Ensure there are no open holes;
 - Ensure all inspection plates are in place;
- Transportation securement including pins, retainers etc.

2.1.1 **LEVEL I INSPECTION PERSONNEL**

Level I inspections are performed by the rig crew and should also be included as part of the daily rig walkaround carried out by the Driller or Rig Manager.

2.1.2 **LEVEL I INSPECTION DOCUMENTATION**

Level I inspections shall be recorded in the tour sheet.

2.3 **LEVEL II INSPECTION**

A Level II inspection is a Level I inspection that includes a more thorough inspection of the equipment that includes checking for:

- Obvious cracks in structural components;
- Damage and/or premature wear or deterioration;
- Missing and/or damaged parts or guards;

- Distortion in mechanical parts;
- Damage and/or wear to cables and chains.

2.3.1 LEVEL II INSPECTION PERSONNEL

Level II inspections shall be carried out by the Driller, Rig Manager or designate.

2.3.2 LEVEL II INSPECTION DOCUMENTATION

Level II inspections shall be recorded in the tour sheet.

2.4 LEVEL III INSPECTION

A Level III inspection requires rig equipment to be thoroughly checked in the field to determine serviceability. This may, at the owner's/inspector's discretion, include Non Destructive Testing (NDT) techniques, and may require some minor disassembly of guards.

If, during a Level III inspection, it becomes apparent that the routine rig operation has resulted, or may result in, a regular occurrence of significant contact with critical parts of the catwalk, suitable equipment or procedures must be utilized to prevent further damage.

Any repairs required shall be done in accordance with [Section 4 - Repairs, Maintenance and Documentation](#).

2.4.1 LEVEL III INSPECTION – DRILLING RIGS

Upon reaching the required number of operating days, as outlined in [Section 3 - Inspection Frequency](#), the equipment shall be Level III inspected. At a minimum, the following procedure is required:

- A thorough visual inspection of all load bearing components, welds and pick-up points to determine the condition of the equipment.

2.4.2 LEVEL III INSPECTION PERSONNEL

Personnel qualified to supervise and conduct a Level III inspection include:

- Inspection Personnel as described in [Section 5.1.1](#);
- Professional Engineer's as described in [Section 5.1.4](#);
- Original Equipment Manufacturers (OEM) as described in [Section 5.1.5](#).

2.4.3 LEVEL III INSPECTION DOCUMENTATION

Level III inspections must be documented in the CAODC Mast and Overhead Equipment Log Book, or suitable equivalent.

2.5 LEVEL IV INSPECTION

A Level IV inspection requires the equipment to be disassembled as required to do a complete inspection. Upon reaching the required number of operating days, as outlined in [Section 3 - Inspection Frequency](#), the equipment shall be Level IV inspected. At a minimum, the following procedure is required:

- Clean the catwalk as required to prepare for inspection;
- Inspection of pipe transport system including cables, chains, sprockets, drums etc.;
- Inspect structural condition and verify intended use of all lug and attachment points;
- At the discretion of the owner, ensure pipe and casing support arms have been load rated by a Professional Engineer, or if the support arms are already load rated, be confirmed by a Professional Engineer;
- NDT of all critical load bearing components.

If, during a Level IV inspection, it becomes apparent that the routine rig operation has resulted, or may result in, a regular occurrence of significant contact with critical parts of the catwalk, suitable equipment or procedures must be utilized to prevent further catwalk damage.

2.5.1 ONE-TIME EXTENSION PROVISION

Prior to the 1000th operating day, a one-time extension of 100 operating days may be granted by the owner providing:

- A Level III inspection is performed and documented.

Note: *a well spudded prior to the expiry of the original 1000 operating days may be completed.*

2.5.2 **LEVEL IV INSPECTION PERSONNEL**

Personnel qualified to supervise a Level IV inspection typically include:

- Inspection Personnel as described in [Section 5.1.1](#);
- Professional Engineer's as described in [Section 5.1.4](#);
- OEM Agent as described in [Section 5.1.6](#).

2.5.3 **LEVEL IV INSPECTION DOCUMENTATION**

Documentation will be provided by the designated inspection personnel and should include the following information:

- Document author;
- Date of inspection;
- Catwalk serial number (if available);
- Name of manufacturer (if available);
- Date of manufacture (if available);
- Pipe and casing support arm load ratings (if applicable).

Note: *it is owner's responsibility to verify whether the rack load ratings apply per rack or per set;*

- Results of the Level IV inspection;
- Location of repairs (if applicable).

Additionally, Level IV inspections must be documented in the CAODC Overhead Mast and Equipment Log Book, or suitable alternative, and signed by Inspection Personnel as outlined in [Section 5.1.1](#).

3. **INSPECTION FREQUENCY**

At a minimum, the inspection frequency of catwalks shall be conducted in accordance with the schedule below.

Note: *should circumstances, OEM recommendations or individual experience dictate otherwise, CAODC member companies may conduct these inspections at greater frequencies.*

| Level I | Level II | Level III | Level IV |
|---------|----------|-----------|------------|
| Daily | Weekly | 250 days | 1,000 days |

Note: *one operating day = 24 accumulated operating hours from spud to rig release.*

4. **REPAIRS, MAINTENANCE AND DOCUMENTATION**

Occasionally repairs and/or maintenance following a Level III or IV inspection may be required to retain the operating integrity of the equipment. Any damage that requires repair will be categorized as minor or major as follows:

4.1 **MINOR DAMAGE**

Minor damage includes the following:

- Damage or distortion to secondary equipment;
- Non-critical structure damage (e.g. cosmetic damage to diagonal girts, handrails, decking and minor distortions).

4.1.1 **MINOR DAMAGE REPAIR PERSONNEL**

Minor repairs may be completed by Operating Personnel, as described in [Section 5.1.2](#), at the discretion of the Rig Manager or higher authority.

If there is any question as to whether the damage is minor or major, either a Professional Engineer or OEM Agent as described in [Section 5.1 - Personnel Qualifications](#) must be consulted.

4.2 **MAJOR DAMAGE**

Major damage includes the following:

- Geometrical distortion;
- Structural damage;

- Damage that requires repair to critical structures such as:
 - Load bearing components;
 - V-door cylinder attachment points;
 - Elevated trough structure;
 - Pipe supporting racks fixed to the catwalk.

All major damage must be repaired and requires an NDT inspection upon completion. Repairs may be completed in a field environment provided they can be performed adequately and are accessible for NDT inspection.

4.2.1 MAJOR DAMAGE REPAIR PERSONNEL

Repairs to major damage require the consultation of a Professional Engineer or OEM Agent as described in [Section 5.1 - Personnel Qualifications](#).

4.3 REPAIR AND MAINTENANCE DOCUMENTATION

All major repairs performed shall be documented in the CAODC Mast and Overhead Equipment Log Book, or suitable alternative, and include the following information:

- Date repairs were conducted;
- Description of repairs that were completed;
- The Professional Engineer or OEM Agent that provided consultation during the repair.

5. PERSONNEL QUALIFICATION, TRAINING AND DOCUMENTATION

5.1 PERSONNEL QUALIFICATIONS

5.1.1 INSPECTION PERSONNEL

Typical Inspection Personnel are considered to be senior operations personnel designated by the company that have:

- Knowledge of working principles of the equipment referenced in this RP;
- Mechanical competency in the disassembly of the equipment type and model;

- Experience and knowledge in drilling rig maintenance.

Examples of senior operations personnel include: Rig Managers, Field Superintendents, Technologists, Rig-up Superintendents, Shop Foremen, and Operations Managers.

5.1.2 OPERATING PERSONNEL

Typical Operating Personnel are considered to be members of the rig crew that have:

- Knowledge of working principles of the equipment referenced in this RP;
- Experience and knowledge in drilling rig maintenance.

5.1.3 NDT TECHNICIANS

At a minimum, NDT Technicians are required to have Level II, Canadian Government Standards Board (CGSB) certification or other approved certification/training, at the discretion of the owner/inspector.

5.1.4 PROFESSIONAL ENGINEERS

Professional Engineer's shall have:

- Previous experience and training in structural and/or mechanical analysis;
- A practical working knowledge of equipment referenced in this RP;
- Previous experience and training in the repair of the equipment referenced in this RP;
- Experience with general quality control standards;
- Professional status in Canada.

5.1.5 ORIGINAL EQUIPMENT MANUFACTURERS (OEM)

The company who built the original piece of equipment under inspection.

5.1.6 ORIGINAL EQUIPMENT MANUFACTURER AGENT

A designate of the OEM that has a practical working knowledge of the specific equipment under inspection.

5.1.7 WELDERS

Welders must hold a Journeyman Welder certificate and have previous experience in drilling rig maintenance.

5.2 PERSONNEL TRAINING

To satisfy provincial regulations and ensure that equipment will operate in the manner for which it was designed, Inspection and Operating Personnel (as described in [Section 5 - Personnel Qualification, Training and Documentation](#)) shall be adequately trained to conduct inspections (including visual) in accordance with this Recommended Practice. At a minimum, training should outline the inspection criteria for all critical components outlined in this Recommended Practice.

5.3 PERSONNEL DOCUMENTATION

Companies shall have a process in place that documents and retains all training administered to company personnel referenced in this Recommended Practice and should include:

- Date training took place;
- Who was in attendance.