



S N U B B E R U S E R S G R O U P

SNUBBER USERS GROUP 2024 SUMMER CONFERENCE & TRADE SHOW

**Call To Order
Gus Avila**

ADMINISTRATIVE ITEMS

- Safety Items & Logistics
- Agenda Review
 - Afternoon Closed Session at 3 pm



ACKNOWLEDGEMENTS & RECOGNITION



ACKNOWLEDGEMENTS
&
RECOGNITION

***CURTISS -
WRIGHT***

JOHN KNEZEVIC

RILEY SMITH



PRESIDENTS AWARD



PRESIDENTS AWARD PRESENTED TO RICK PORTMANN



SNUBBER USERS GROUP

SNUBBER USERS GROUP

President's Award

The SNUbber Users Group (SNUG) is proud to present this President's Award in recognition of outstanding commitment and contribution to

Rick Portmann

We proudly present this award in recognition of your many years of leadership and support to this group and your dedication to the nuclear power industry. Your ambition for perfection and integrity in achieving that perfection set an example that motivates us all to become not only better individuals. The contributions that you have made to this group and the industry in your roles as a participant and a leader define not only who you are as an individual, but also who we are as an industry support group. Without your service, support and dedication, we would not have become the successful organization that we are today. We are deeply grateful for all your contributions to the nuclear power industry and to this group.

The SNUbber Users Group proudly presents this award to our friend and colleague as a memento of our gratitude.

UNFORTUNATELY, RICK COULD NOT BE HERE DUE
TO A FAMILY EMERGENCY.

WE WERE REALLY HOPING TO BE ABLE TO HAND
SOMEONE A PLAQUE HONORING THEIR SERVICE TO
SNUG

SO

WE DECIDED TO DO JUST THAT.



PRESIDENTS AWARD PRESENTED TO MITCH ETTEN-BOHM



SNUBBER USERS GROUP

SNUBBER USERS GROUP

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Mitch Etten-Bohm

We proudly present this award in recognition of your many years of support and guidance to this group and your dedication to the nuclear power industry. Your ambition, integrity, and leadership set an example that motivates us all to become not only better nuclear workers but better individuals as well. The contributions that you have made to this group and the industry in your roles as a participant and a leader define not only who you are as an individual, but also who we are as an industry support group. Without your service, support and dedication, we would not have become the successful organization that we are today. We are deeply grateful for all your contributions to the nuclear power industry and to this group.

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ASC Service Center

Providing Mechanical & Hydraulic Snubber Testing,
Inspections, Repairs & Certifications for Contaminated
Snubbers under our Radioactive Material License



Radioactive Materials License No. PA-1682

		COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF RADIATION PROTECTION		Page 1 of 3 Pages License No. PA 1682 Amendment No. NEW
RADIOACTIVE MATERIALS LICENSE				
Pursuant to the Radiation Protection Act, the Act of July 19, 1984 (P.L. 888) (28 P.S. §§ 7116.101 - 7116.703) and Title 26, Rules and Regulations, Article V, Radiological Health of the Pennsylvania Department of Environmental Protection, and in reliance on statements and representations heretofore furnished by licensee to receive, acquire, possess, transfer, and use radioactive material listed below for the purposes and at the places designated below. This license shall be deemed subject to all applicable rules, regulations, or orders of the Pennsylvania Department of Environmental Protection now or hereafter in effect and to any conditions specified below:				
Licensee 1. Anvi International LLC 2. 2081 Spring Road, Suite 300 Oak Brook, IL 60523		3. In response to application dated January 31, 2023, correspondence dated June 13, 2023, August 8, 2023, and October 18, 2023, and electronic correspondence dated October 31, 2022 through March 5, 2024. 4. License No. PA - 1682 is issued in its entirety. Program Code: 3221 Priority: 5 5. Expiration Date: March 31, 2038		
6. Byproduct, source, and/or special nuclear material		7. Chemical and/or physical form		8. Maximum amount that licensee may possess at any one time under this license
A. Any radioactive material with atomic numbers 2 through 83, inclusive		A. Contamination in or on nuclear reactor components		A. No single reactor component to contain more than 500 µCi of total activity
B. Any radioactive material with atomic numbers 84 through 98, inclusive		B. Contamination in or on nuclear reactor components		B. No single reactor component to contain more than 0.50 µCi of total activity
C. Hydrogen 3		C. Contamination as radioactive waste in hydraulic fluid or incidental on reactor components		C. No single reactor component to contain more than 4 µCi of H-3
D. Any radioactive material with atomic numbers 2 through 83, inclusive		D. Contamination as radioactive waste on metal, cloth, paper, plastic, or other dry materials		D. 50 µCi
E. Any radioactive material with atomic numbers 84 through 98, inclusive		E. Contamination as radioactive waste on metal, cloth, paper, plastic, or other dry materials		E. 0.05 µCi
F. Technetium-99		F. Anodized Aluminum Foil Plated check source		F. 0.02 µCi
G. Technetium-99		G. Anodized Aluminum Foil Plated check source		G. 0.005 µCi
H. Americium-241		H. Anodized Aluminum Foil Plated check source		H. 0.005 µCi
I. Americium-241		I. Anodized Aluminum Foil Plated check source		I. 0.001 µCi
J. Americium-241		J. Anodized Aluminum disk check source		J. 0.01 µCi
K. Chlorine-36		K. Anodized Aluminum disk check source		K. 0.012 µCi
9. Authorized use: A. through E. Possession incident to decontamination, repair, testing, and maintenance of snubbers and/or nuclear reactor components. F. through K. Calibration and testing of instruments				

Contamination Limits per Snubber

Contamination Type	Fixed Contamination (dpm/100 cm ²) per Snubber	Loose Contamination (dpm/100 cm ²) per Snubber
Beta	< 250,000	< 2200
Alpha	< 250	< 20

Assumes an approximate 10% detection efficiency for fixed alpha and beta contamination using a 100 cm² alpha and beta probe ~ 1/8" from the surfaced monitored.

Package Limits

All packages shipped to the ASC Service Center must be sent as a Limited Quantity per DOT regulations. Packages greater than this level won't be accepted.

Shipping papers, generated for a snubber shipping package using industry accepted software, should indicate the maximum dose rate at 1 meter from the package is 0.1 mR/hr or less.

ASC may send removed snubber parts back to the client for proper disposal at the client's facility.

ASC Service Center



ASC Service Center – Equipment

- Barker – Diacon 2000NM Series Snubber Test Bench
- Mobil ICAM System
- Portable Monitor Argos – 3PAB
- SAM Cronos -11
- Friskers
- Dosimetry
- Calibration Sources

Documentation

- 23 Site Specific Procedures

ASC Service Center



Snubber Services

ASC Certified Service Technicians Test, Inspect, Repair and Certify contaminated snubbers under our Radioactive Material License.

Servicing all types of Mechanical & Hydraulic Snubbers

Anchor Darling	Anvil	Basic Engineer
Bergan Patterson	Boeing	E-Systems
Grinnell	Lisega	McDowell Wellman
Paul Munroe	Power Piping	PSA

ASC Service Center



Thank you, please stop by our Booth or see us in our Mobile Test Trailer for additional details.

We appreciate your business!

Please email all RFQ's to: gnelson@asc-es.com

Meet
ASIO X





ULTRA BRIGHT LIGHTING

Illuminates confined spaces to provide crystal clear images with market leading 40k lumens.

Inspect and unveil defects of areas inaccessible before.

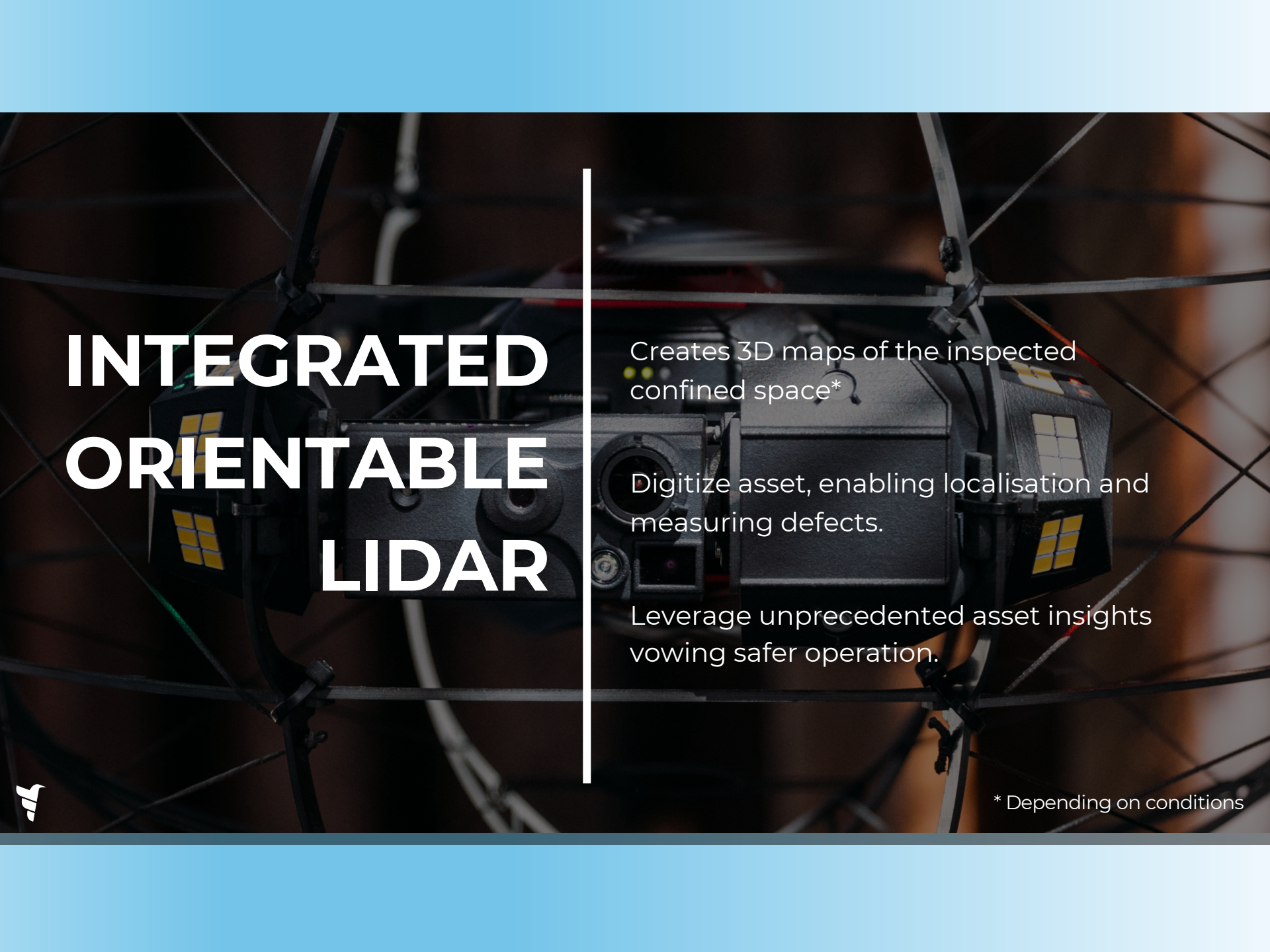
Experience better, easier & safer inspections while unlocking more business opportunities.





INTEGRATED GAS DETECTION

- Detects, locates & quantifies 4 gases: Methane, Hydrogen Sulphide, LEL Oxygen, Carbon Monoxide. This in addition to Temperature & Humidity
- Intervene swiftly to potential hazards and keep your staff safe.
- Ensure a better asset situational awareness, and a safer working environment for humans.



INTEGRATED ORIENTABLE LIDAR

Creates 3D maps of the inspected confined space*

Digitize asset, enabling localisation and measuring defects.

Leverage unprecedented asset insights vowing safer operation.

* Depending on conditions



Resists disturbances thanks to Radar based advanced stabilization technology.

Fly stress free anywhere

Unlock more business opportunities in harsh environments.

STABLE IN HARSH ENVIRONMENTS



LONGEST FLIGHT TIME

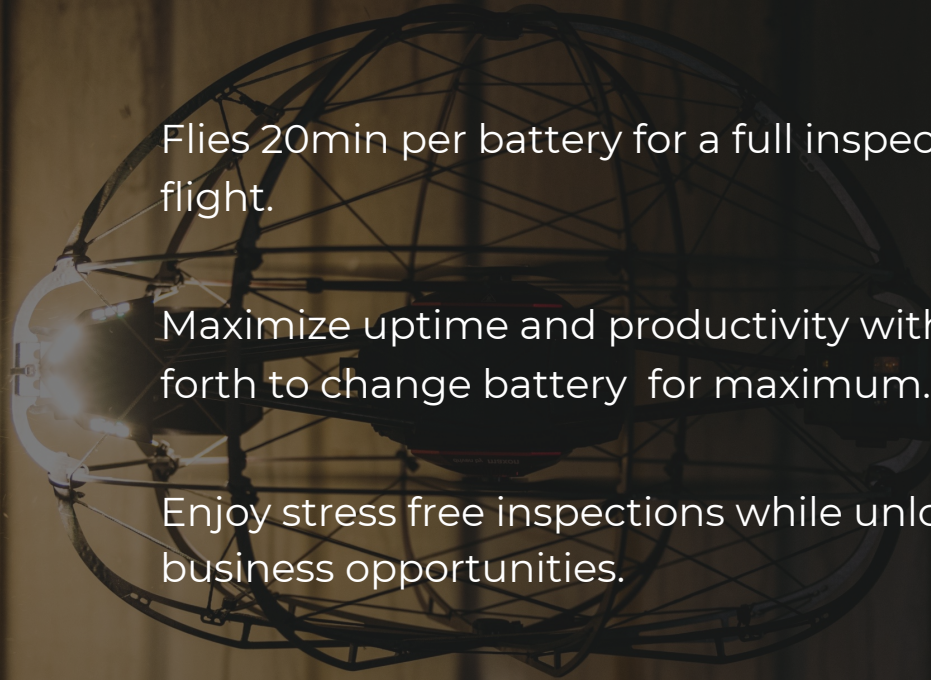


20 MIN

Flies 20min per battery for a full inspection in a single flight.

Maximize uptime and productivity with less back and forth to change battery for maximum.

Enjoy stress free inspections while unlocking more business opportunities.





EASY TO PILOT

Offers intuitive user interface for a super quick learning curve.

Inspect dark, dusty and narrow environments. Authorise simplified inspection and pilot assistance.

Save on expert pilots.



ASSISTS

WALL LOCK

enables locking onto a wall at a fixed distance and angle for scanning horizontally and vertically. The angle to the wall can be set to either be 0° or 180° (facing or looking away from the wall with the camera). The distance settings can either be chosen from presets or set to "Auto" which locks the current distance.

VELOCITY LOCK

prevents the drone from drifting once activated, using drone sensors to measure the drone's velocity within the environment. When using Above Water mode, the downward-facing optical-flow sensor is automatically deactivated to prevent the drone from following the flow of water.

TUBE LOCK

centers the drone in the middle of a tube while moving forward. This feature works in tubes of any angle, ensuring the drone always remains centered.

REPULSION MODE

uses IR sensors positioned around the drone for collision avoidance, maintaining a minimum distance from detected obstacles. It is used when flying in low-dust environments with large obstacles.

HEIGHT LOCK

locks the altitude or distance to the floor, the roof, or both, maintaining the same height. This is achieved using the barometer or IR sensors and functions effectively even in dusty conditions

NEW



ROBUST CAGE

A robotic arm is shown holding a spherical wireframe cage. The cage is made of a complex network of thin metal rods. The background is a light blue sky. The text 'ROBUST CAGE' is overlaid on the left side of the image.

Protects from impacts and collisions.

Fly again after impacts and collisions.

Save on repair cost thanks to top durability & survivability.



ASIO X

INTEGRATED MULTI-GAS DETECTOR

Detects, locates & quantifies 4 gases: Methane, Hydrogen, Sulphide, Oxygen, Carbon Monoxide.

INTEGRATED ORIENTABLE LIDAR

Creates accurate 3D maps of the inspected confined space.

ULTRA BRIGHT LIGHTING

Illuminates confined spaces to provide crystal clear images with industry leading 40k lumens.

EASY TO USE

Intuitive user interface and controls to expedite the learning curve.

LONGEST FLIGHT TIME

20min per battery for a full inspection in a single flight.

STABLE IN HARSH ENVIRONMENTS

Advanced Radar-based stabilization Technology increases inspection success in volatile environmental conditions.

DUAL CAMERA SYSTEM

Dual 4K and RadioMetric IR Cameras with 180° unobstructed vertical FOV.

VIO TECHNOLOGY

Utilize camera data and inertial sensors to maintain precise positioning even in GPS-denied environments.

ROBUST CAGE

Protects from impacts and collisions.



INSPECTION WORKFLOW



Flybotix is taking the ASIO solution from data collection, to a whole new data centric solution that will, in addition, enable data management, data processing & predictive maintenance



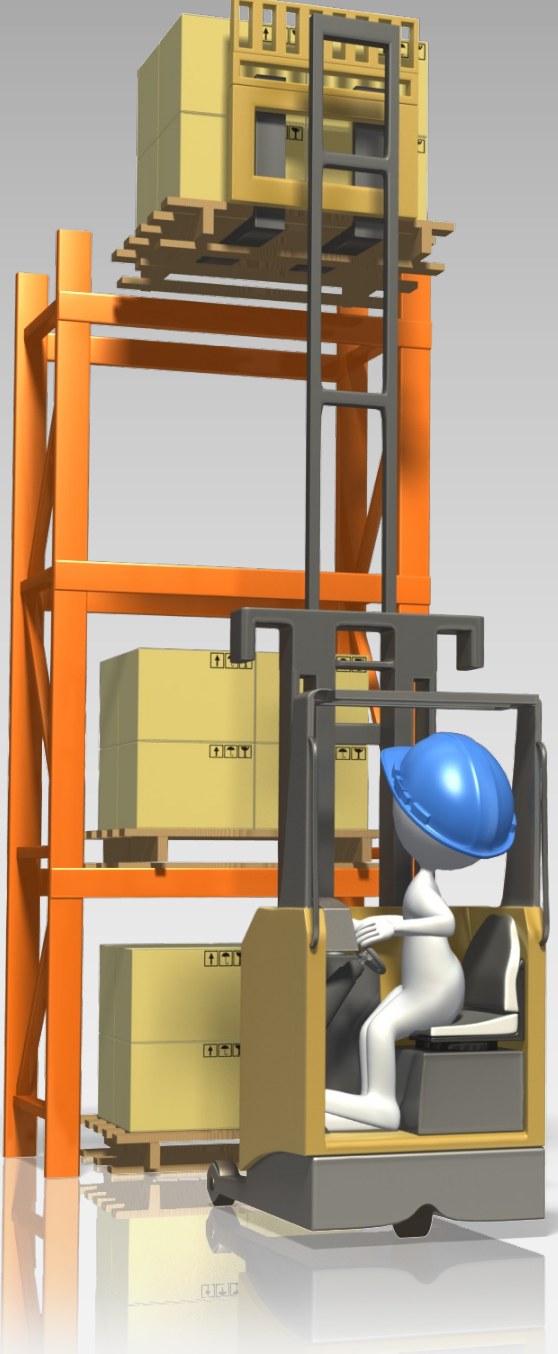
ASIO X

**Streamlined inspection process
Fast decision making**





Snubbers Rotated from Stock



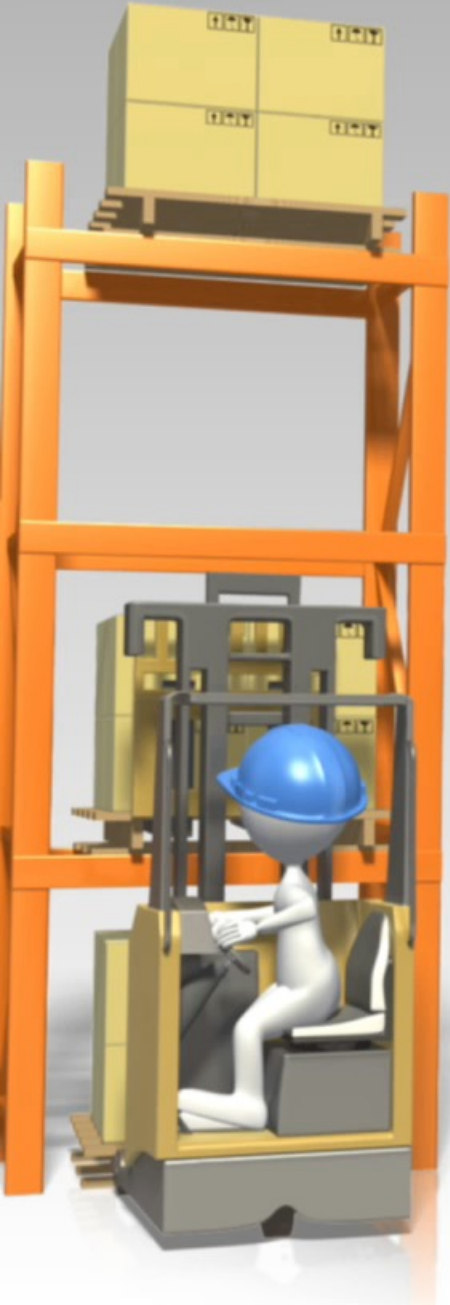
Snubber Replacement

ISTD-1600 currently requires the user to follow the rules of the ASME Boiler & Pressure Vessel Code, Section XI, when replacing a snubber.

ISTD-1600 Snubber Modification and Replacement

Snubber repair and replacement activities shall be performed in accordance with ASME BPVC, Section XI, as applicable.

ISTD-1610 Suitability. Replacement or modified snubber(s) shall have a proven suitability for the application and environment.

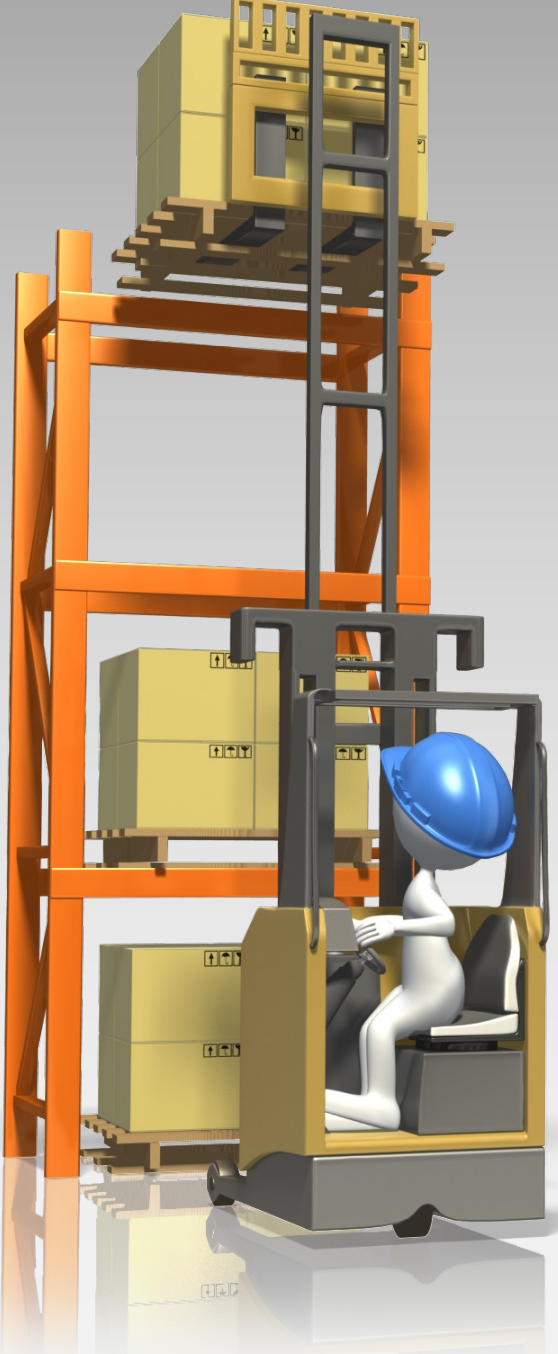


Paragraph IWA-4132 of ASME Section XI specifies the requirements for replacing snubbers

IWA-4132 States:

IWA-4132 Items Rotated From Stock

Snubbers, pumps, pressure relief valves, control rod drive mechanisms, or pressure-retaining items of pump seal packages, rotated from stock need not meet any other requirement of [Article IWA-4000](#), provided the following requirements are met:



(a) The rotation shall be only for testing or preventive maintenance of the removed items.

This means that IWA-4132 requirements can only be applied if the snubber is being replaced to be tested or because of service life monitoring requirements.

(b) Items being removed and installed shall be of the same design and construction.

This means that the replacement snubber must be identical to the snubber being removed. If a design change package is required, IWA-4132 requirements cannot be used.



(c) Items being removed shall have no evidence of failure at the time of removal.

If a snubber has failed a visual examination or is being removed to be tested because its operational readiness is in question, IWA-4132 requirements cannot be used.



(d) Items being rotated shall be removed and installed only by mechanical means.

If the snubber being removed or installed is only pinned in the support, IWA-4132 can be used. If cutting, welding or grinding is required to remove or install a snubber, IWA-4132 requirements cannot be used.



(e) Items being installed shall previously have been in service.

This one is a little tricky. A brand new snubber has obviously never been in service, so IWA-4132 would not apply. However, from an ASME standpoint, a snubber that has only previously been installed in a non-ASME support has also never been in service because it has not been certified for use in an ASME application by way of being documented on an ASME Code Data Report (N-5, NIS-2, NIS-2A, etc.).



(f) The Owner shall track the items, by unique item identification, to ensure traceability of the installed location and inservice inspection and testing records.

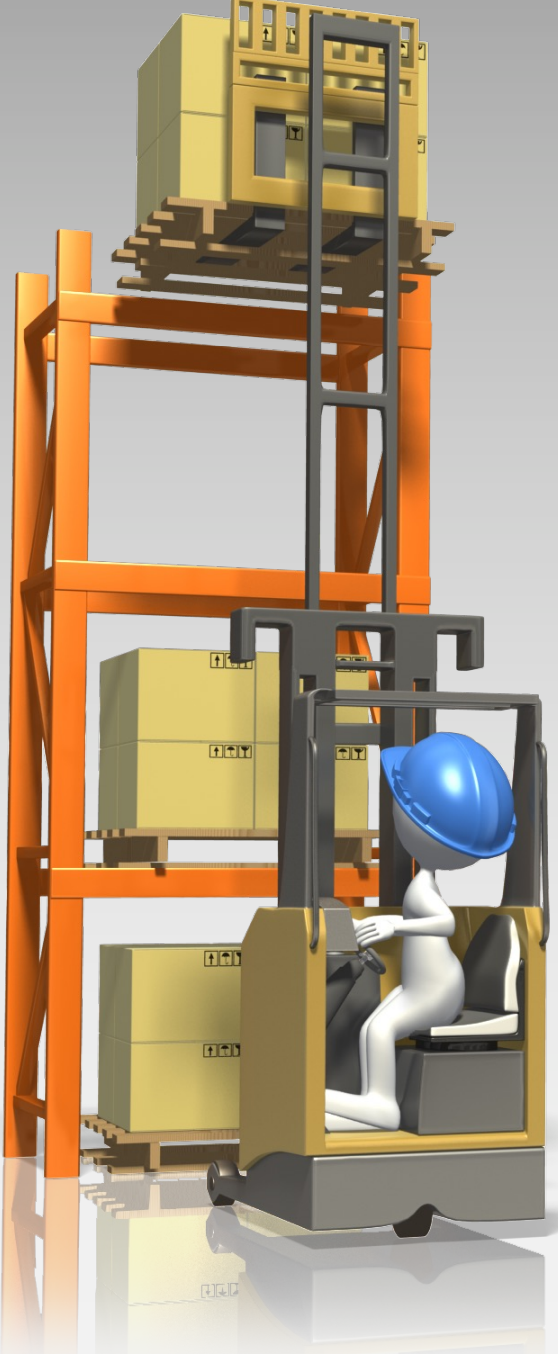
The Owner must have records of all the places that the snubber has been since it was new so that a complete history of the locations the snubber has been installed in can be traced.



(g) Use of an Inspector and an NIS-2 form are not required.

If you have met all the requirements previously outlined, then your ASME Code Engineer does not have to complete an NIS-2 Form or notify the Authorized Nuclear Inservice Inspector (ANII) of the replacement.

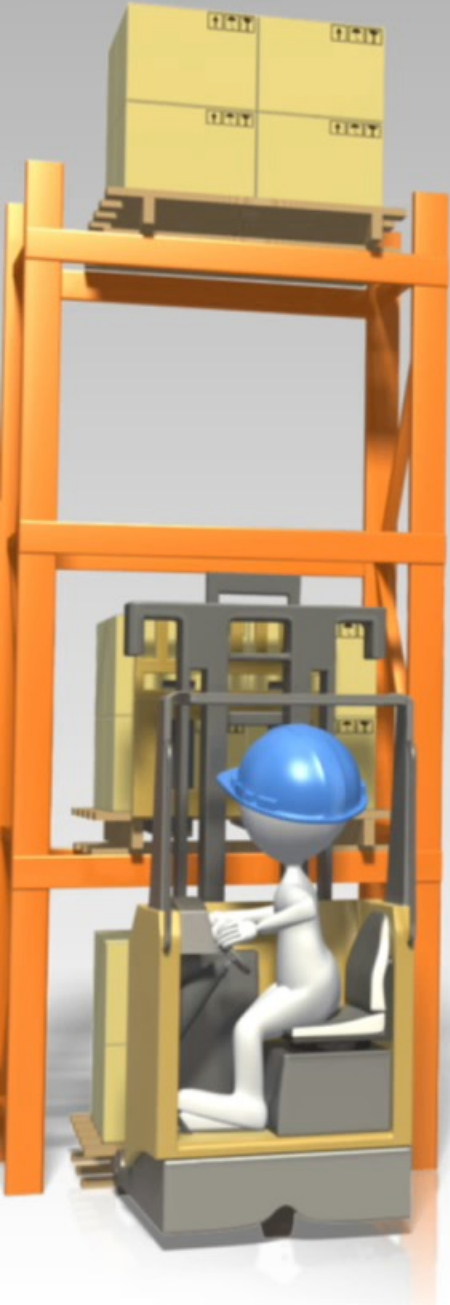




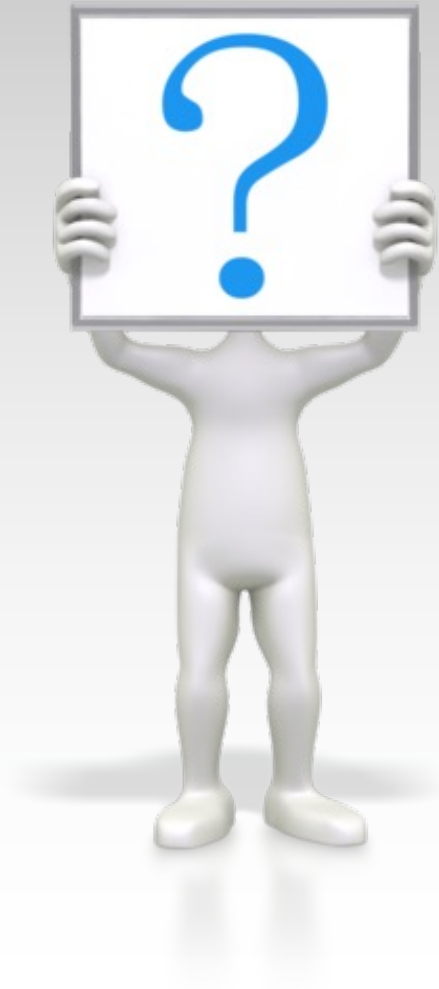
(h) Repair/replacement activities on removed items shall be performed in accordance with the requirements of this Article.

If you have plans to use the removed snubber in an ASME application in the future, then a Repair Replacement Activity package must be initiated by the ASME Code Engineer to continue traceability of the removed snubber for future use.

Snubber Replacement



If you have met ALL the requirements of the previous slides that describe IWA-4132 requirements, then your snubber can be replaced from rotated stock without completing all the ASME Code required forms and making notifications to the ASME Code Engineer or the ANII. If you have not met all the requirements outlined previously, then your ASME Code Engineer must be notified, and additional documentation will be required.



Questions? Comments?

MORNING BEVERAGE BREAK

SPONSORED BY



RETURN BY 10:00 AM



BEYOND CODE REQUIREMENTS – BEST PRACTICES

► SNUG 2024

PURPOSE

The purpose of this presentation is to provide activities performed at utilities that may be considered best practices for qualification, examination, testing, and service life monitoring.

Several white lines of varying lengths and angles are positioned in the bottom right corner of the slide, creating a modern, abstract graphic element.

VISUAL EXAMINATION

- ▶ Some sites have qualified their snubber examination personnel to be able to perform the visual exams on the snubber, and the support(s), similar to what was done previously under Section XI, IWF-5000.
- ▶ Some sites on OMN-13 have broken up their 100% visual examinations over several outages to levelize scope, align snubber examinations with train outages, and reduce the burden of completing all snubber examinations in a single outage.

VISUAL EXAMINATION

- ▶ Sites have completed remote examination of snubbers utilizing poles and cameras thereby eliminating costly scaffolds and dose.
 - ▶ Sites not on OMN-13 have incorporated into their procedures the performing of examinations on a snubber anytime it is removed from service for any reason.
- 
- A series of white diagonal lines of varying lengths and thicknesses are positioned in the bottom right corner of the slide, creating a modern, abstract graphic element.

TESTING

- ▶ One utility includes the immediately adjacent snubbers to a failed snubber as part of their scope expansion, even if those snubbers are not in the same DTPG.
 - ▶ Some sites utilize the pre-outage window allowed in ISTD to start testing campaigns prior to the start of the outage.
- 
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TESTING

- ▶ Some sites have a document that explains how a failed snubber affects the plant until it is restored to operable status.
 - ▶ Utilize testing of new snubbers when the snubber arrives on site to create a baseline test on the owner's test bench. This not only provides a baseline for comparison in the future, but may provide indications of test bench anomalies.
- 
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SERVICE LIFE MONITORING

- ▶ End of life testing can be performed on snubbers being removed from service for rebuild or end of useful life to demonstrate the adequacy of their service life, show the current service life may be in need of reduction, or to provide data to support a possible extension.
 - ▶ ISTD-6400 requirements are being performed every outage on a portion or all of the snubbers in the large bore snubber population.
- 
- A series of white diagonal lines of varying lengths and thicknesses are positioned on the right side of the slide, extending from the middle towards the bottom right corner.

SERVICE LIFE MONITORING

- ▶ Seal life extensions were completed by multiple utilities to extend the life of snubbers in different applications.
 - ▶ Sites have used hand-stroking as an acceptable method of extending the service life of a mechanical snubber by periodically redistributing the grease.
 - ▶ Sites have a maximum service life allowed before a mechanical snubber removed for testing can be reinstalled without regreasing.
- 
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NON-SAFETY SNUBBERS

- ▶ Some sites include the non-safety snubbers when 100% visual examinations are being conducted leveraging the resources on site at that time to monitor this population.
 - ▶ Some site have started testing a portion of their non-safety snubbers every outage. Sites have replaced the elastomer rod end seals on their large bore snubbers with longer life seals to be able to align the seal replacements with testing activities on a generally rotational basis.
- 
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DISCUSSION

What have we missed?

Several thin, white, parallel diagonal lines are positioned in the bottom right corner of the slide, extending from the right edge towards the center.

SNUG 2024 Presentation
***BOP Snubbers Turbine Stop &
Control Valve Issues***

Ed Dundon
Millstone Power Station

Millstone Unit 2

- Series of Power Upgrades
 - Turbine modification
 - Generator rewind
 - Instrumentation margin reduction

Millstone Unit 2 BOP Snubbers

Program did not originally test of non-safety snubber.

Many of these snubbers were never serviced since construction.

Non-safety related snubbers were installed by the AE to mitigate normal plant transients such as:

- Relief valve actuation
- Fast closure of control and stop valves

Examples are Turbine Control & Stop Valves, Intermediate Stop/Control Valves, Heat Exchanger relief valves.

These snubbers can be dynamically challenged each cycle.

Whereas most safety related snubbers are to mitigate a seismic event that may never get challenged.

Current BOP program

- Monitor & tests on 10% of the population.
- No scope expansion
- Problems are captured & resolved via station CR program
- We used the same Service Life for BOP snubbers & Safety Related snubber
- We used a drop & swap program
- All snubbers are treated as safety-related.

Summary of BOP finding

- Lack of grease
- Dried grease
- Excess wear
- Loose parts
- Alignment between snubber & pipe clamp
- Low fluid levels & fluid leakage

Recent History on Degraded Support

Condition Reports	Description	Date
• CR1227352	Unit 2, The clamp for (NSR) snubber M2HGR-490001B should be redesigned	05/05/2023
• CR1227290	Unit 2, Missing Spacer on Pipe Clamp 490001B	05/05/2023
• CR1226814	M2HGR-490001B has a loose pipe clamp hardware	05/02/2023
• CR1211038	Main Steam Hanger M2HGR-490001B has a loose stud.	10/23/2022
• CR1146054	M2HGR-490001B hardware shows signs of excessive wear	05/02/2020
• CR1067827	Identified a loose fastener on pipe hanger 490001B	05/08/2017

Basis for a Design Change to M2HGR-490001B

- Consequence of not implementing this modification:
 - The current design challenges the functionality of a non-tech snubber M2HGR-490001B. This snubber is downstream of the B Turbine Control Valve on the 28" HP steam line to the Main HP Turbine.
 - Failure of the bolting for the clamp could impact the function of the snubber to restrain MS pipe moment during a Turbine-Generator Trip or a seismic event. Unrestraint MS pipe movement would introduce increased pipe stress and loading in the attached pipe and possibly the HP Turbine inlet nozzle.
- Bridging Strategy until implementation of permanent fix?
 - Currently we are inspecting this pipe snubber each refueling cycle and repairing/replacing as needed.
 - Clamp spacers, nuts, pins and loading studs are available. A new clamp and pad eye is not a stock or off the shelf item.

Revised design for M2HGR-491000B

Recommended Solution

Repair Option	Justification	Cost Breakdown
DC for removal of shim under the beam attachment w/new Pad Eye .	• Eliminates the need for additional inspections with the return to normal inspection frequency of every 18 years. • Eliminate the need to build scaffolding on routine basis for inspection & repair	Labor – 24+ hrs. each inspection Scaffold - \$6000 each inspection Material costs - \$11000 new padeye Civil Engineering - 40 hrs Drawings – 20 hrs



Welcome!

Welcome!

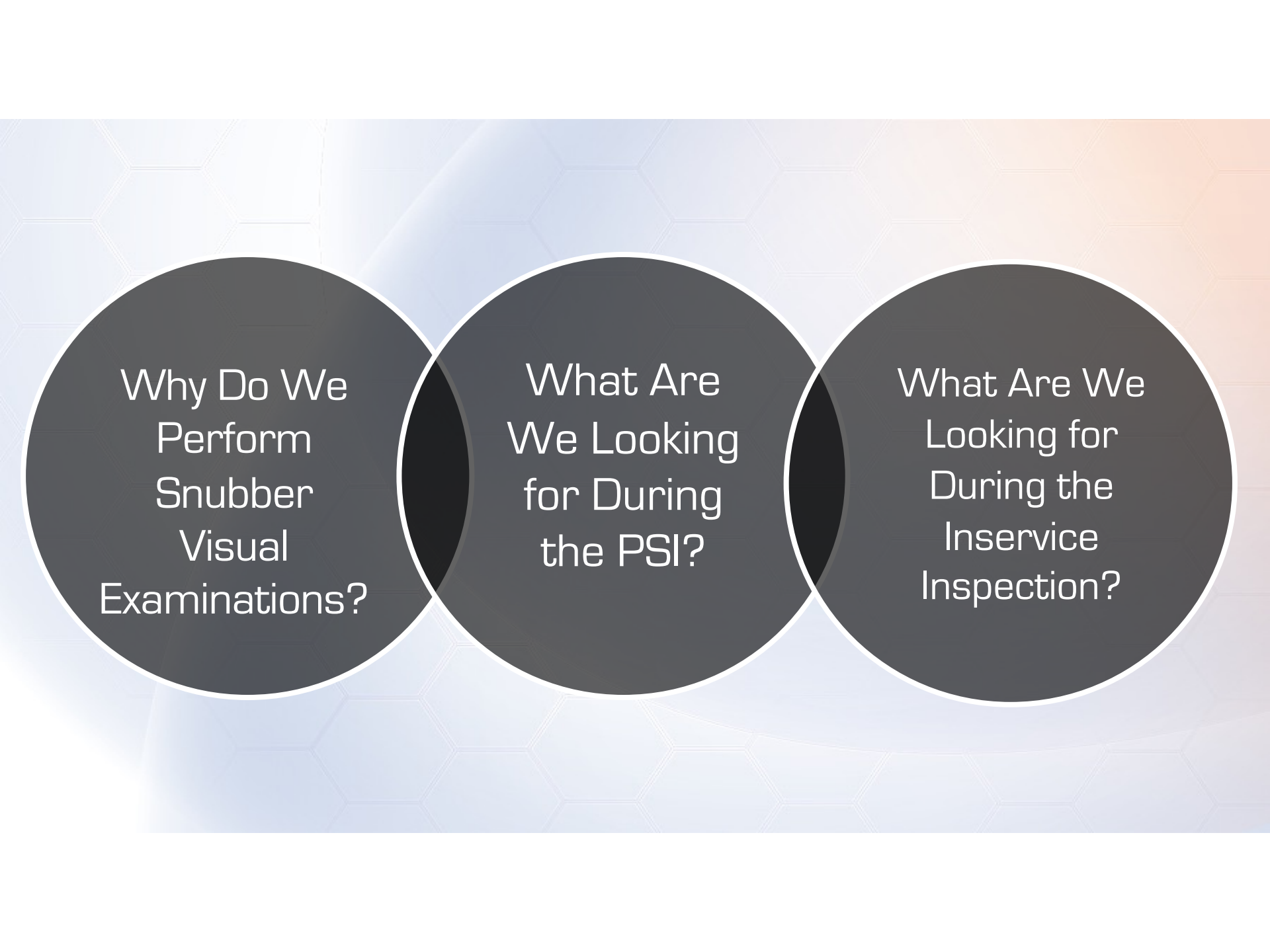




Snubber Visual Examinations

Presented by Scott Esposito

Patrick Peterson, Division Manager, Idideal Concepts Inc.

The image features three overlapping dark gray circles arranged horizontally. Each circle contains white text. The background is a light blue and white hexagonal pattern that transitions into a light orange gradient on the right side. The circles overlap in the center, creating a Venn diagram-like structure.

Why Do We
Perform
Snubber
Visual
Examinations?

What Are
We Looking
for During
the PSI?

What Are We
Looking for
During the
Inservice
Inspection?

Why Do We Perform Snubber Visual Examinations?

- It is required by the Plant Operating License (Tech Specs or TRM)
- It is the Law
 - 10CFR50.55a
- To ensure Operational Readiness of the Snubber on safety-related systems
- ISTA-1100(c) - dynamic restraints (snubbers) used in systems that perform one or more of the three functions:
 - *shutting down a reactor to the safe shutdown condition, or*
 - *maintaining the safe shutdown condition, or*
 - *mitigating the consequences of an accident], Or*
 - *ensure the integrity of the reactor coolant pressure boundary*
- Snubbers in these systems are considered Safety-related or Safety Significant
 - Safety Significant = Outside of ASME Class 1, 2, or 3 boundary, but meets the requirement of ISTA-1100(c).

What Are We Looking for During the Preservice Examination?

- Preservice Examination or Inspection (PSI)
 - What does “Pre-Service” mean - During initial plant startup or for new and modified systems
 - Thermal Movement
 - Incremental Movement Verification
 - Total Movement Verification

What Are We Looking for During the Preservice Examination?

- No visible signs of damage or impaired operational readiness exist as a result of storage, handling, or installation.
- The snubber load rating, location, orientation, position setting, and configuration (e.g., attachments and extensions) are in accordance with design drawings and specifications.
- Adequate swing clearance is provided to allow snubber movement.
- If applicable, fluid is at the recommended level, and fluid is not leaking from the snubber system.
- Structural connections, such as pins, bearings, studs, fasteners, lock nuts, tabs, wire, and cotter pins, are installed correctly.

What Are We Looking for During the Inservice Examination?

- Inservice Examination or Inspection (ISI)
 - What does “Inservice” mean - All examinations of the currently installed snubbers, after plant startup
 - Physical damage,
 - Leakage (if applicable),
 - Corrosion, or
 - Degradation from environmental exposure or operating conditions

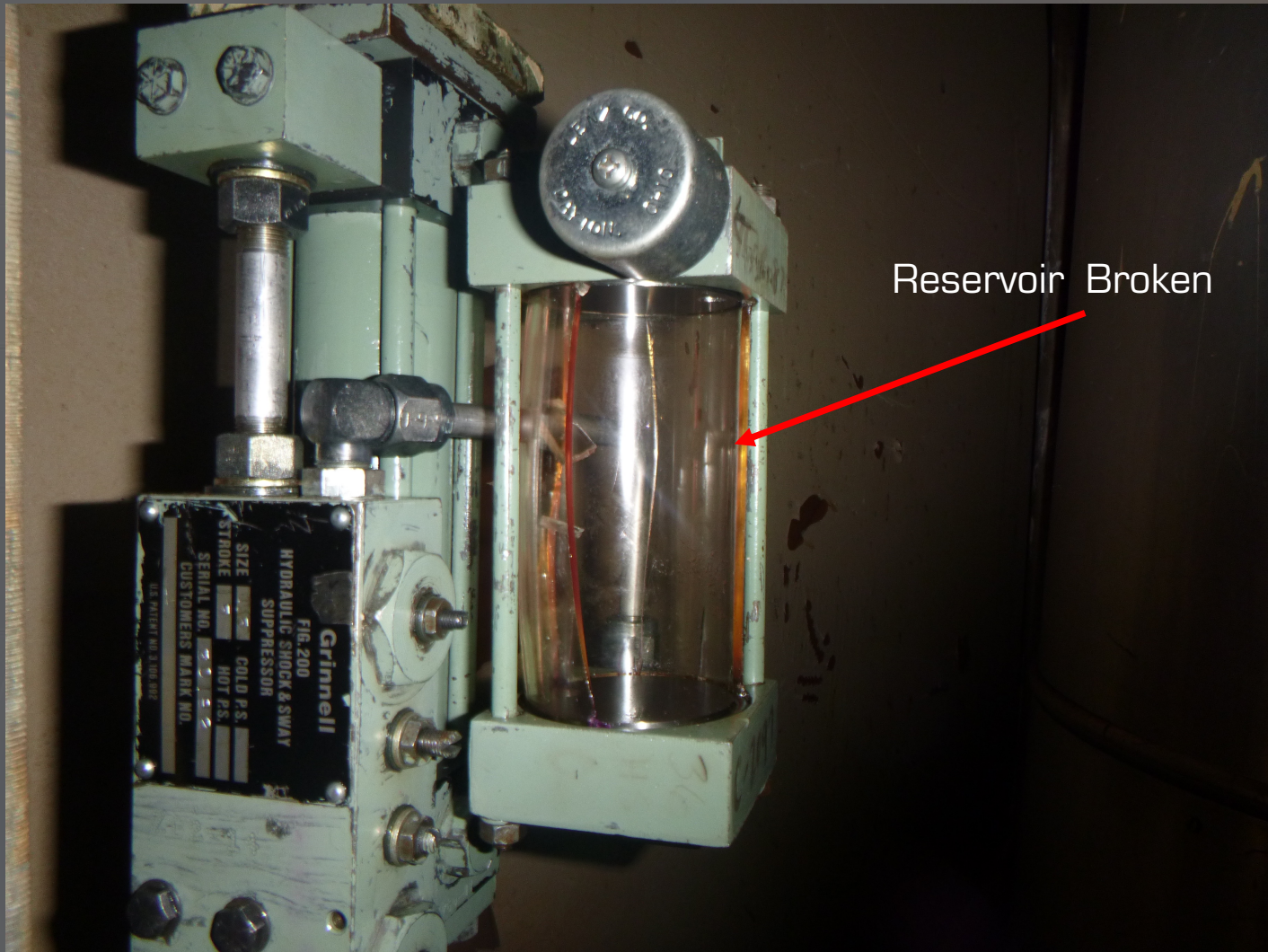
What Are We Looking for During the Inservice Examination?



Bent
Snubber

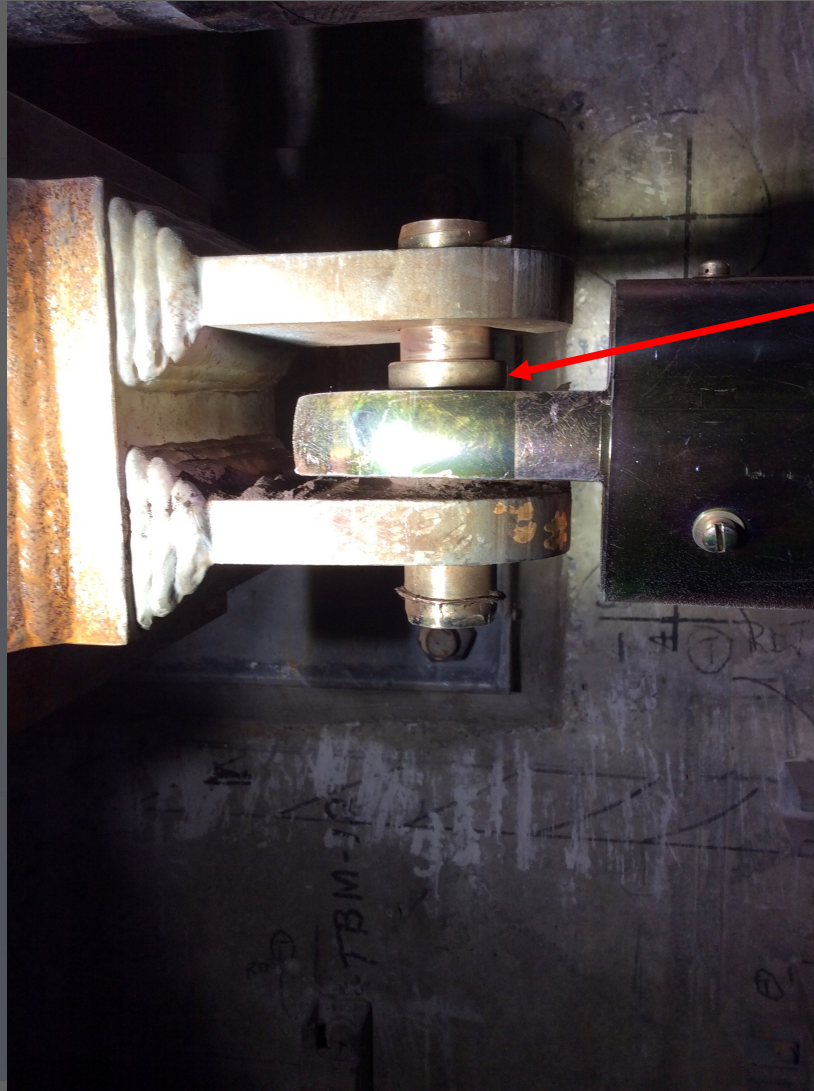


End
Connecto
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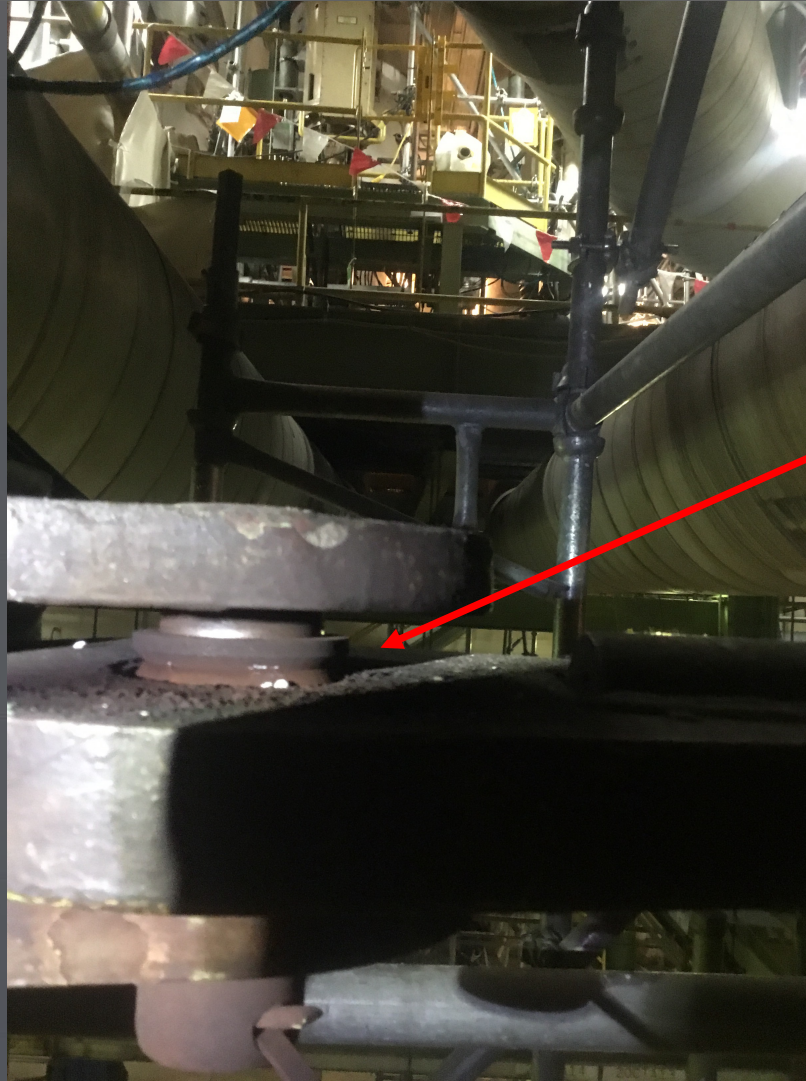




Lexan Reservoir
Melted



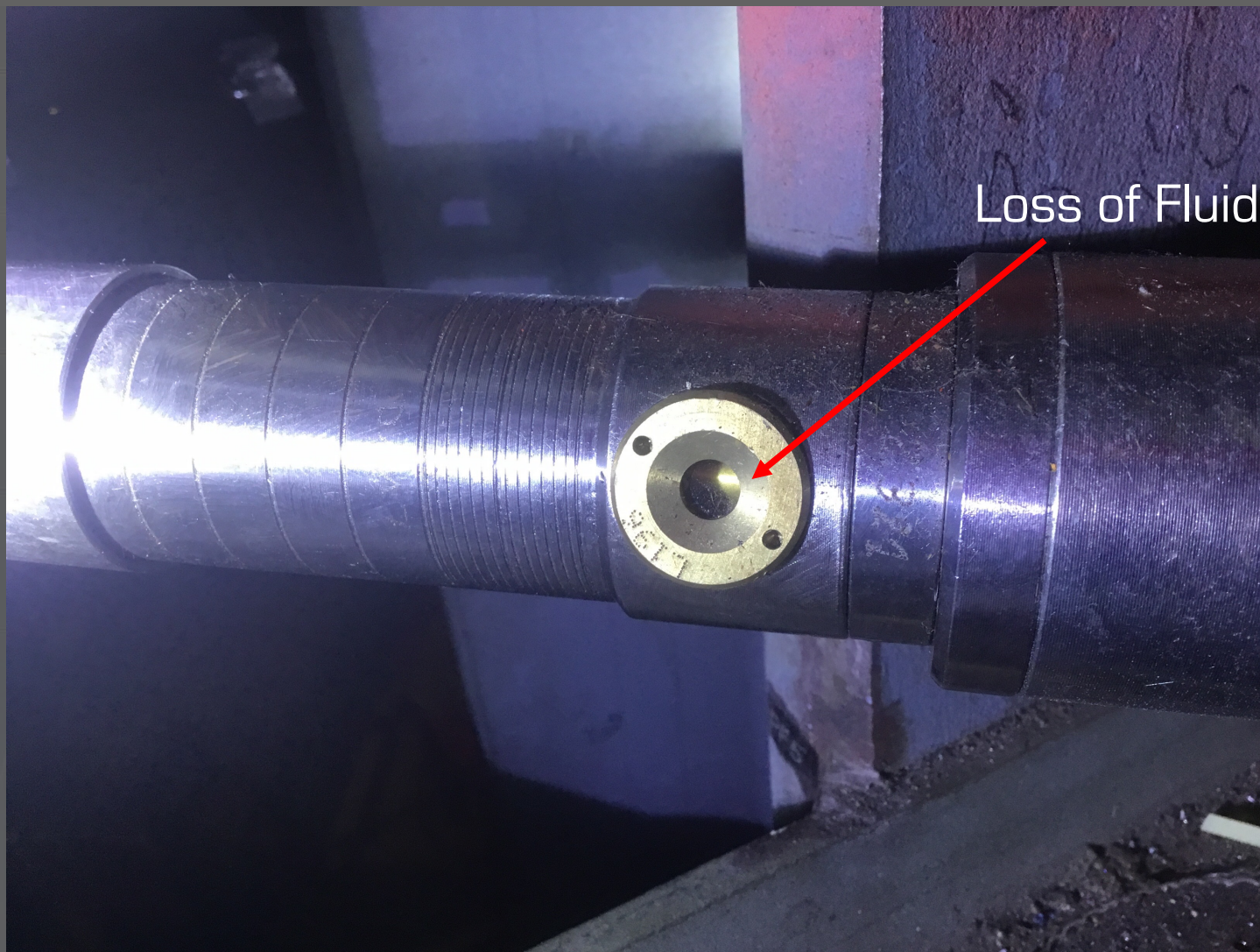
Spherical Bearing
dis-engaged



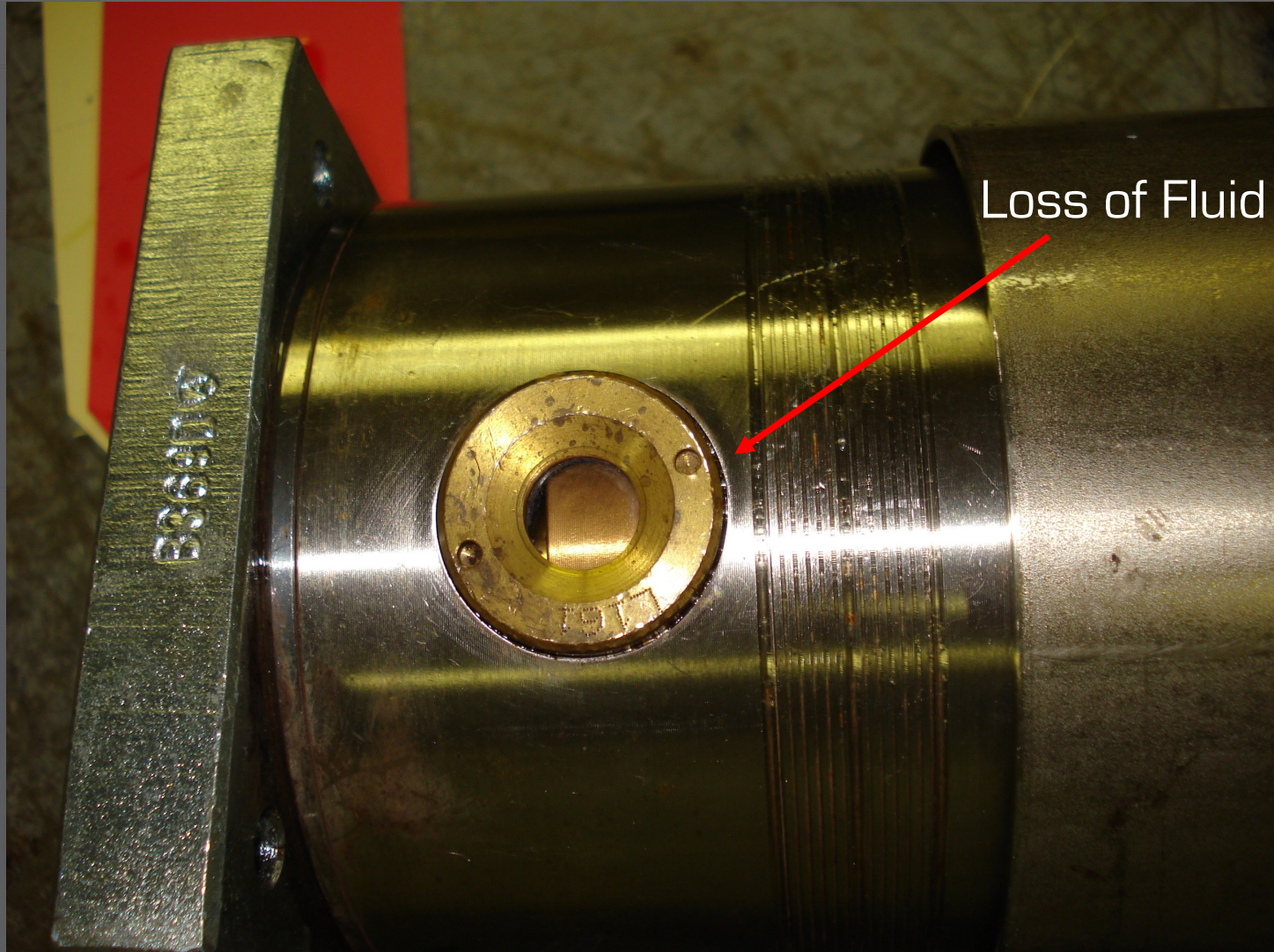
Spherical Bearing
dis-engaged

Loose Jam Nut



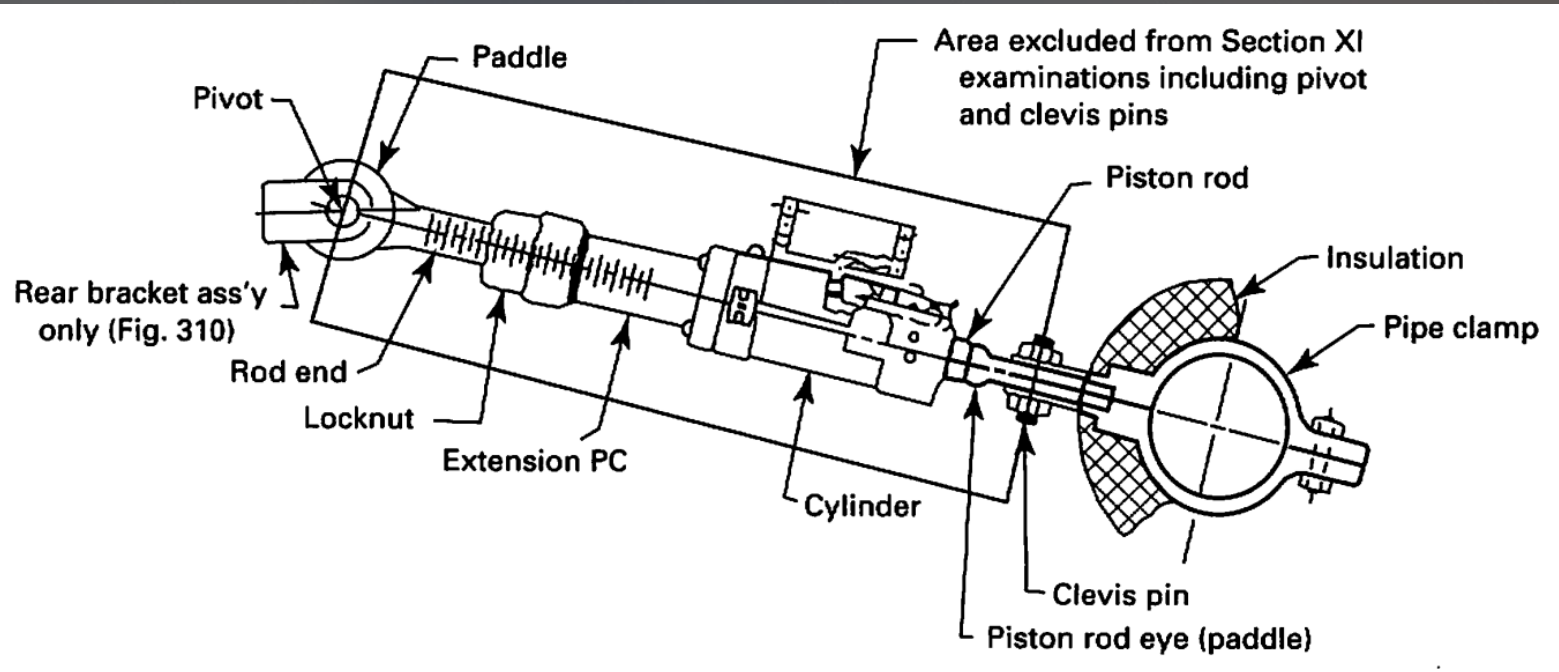


Loss of Fluid



Loss of Fluid

What Are We Looking for During the Inservice Examination?





History

Additional
Code

Visual
Examinations

History of Snubber Visual Examinations

- Snubber examinations were included in ASME Section XI as part of the plant ISI Program, including updates to the ISI Programs
 - ASME Code 1983 Edition thru 2006 Addenda:
 - IWF-5300 INSERVICE EXAMINATIONS AND TESTS
 - (a) Inservice examinations shall be performed in accordance with **ASME/ANSI OM, Part 4**, using the VT-3 visual examination method described in IWA- 2213.
 - IWF-5400 REPAIR/REPLACEMENT ACTIVITIES
 - Repair/replacement activities performed on snubbers shall be in accordance with IWA-4000. Snubbers installed, corrected, or modified by repair/replacement activities shall be examined and tested in accordance with the applicable requirements of IWF-5200 prior to return to service.

History of Snubber Visual Examinations

- IWF-5300 states that in-service examinations shall be performed in accordance with **ASME/ANSI OM, Part 4**.
 - **ASME/ANSI OM, Part 4**, 2.0, 1988 Edition included;
 - Preservice Examinations
 - Preservice Thermal Movement Examination
 - Inservice Examinations
 - Requirements
 - Frequency
 - Sample Size
 - Failure Evaluation
 - Corrective Action and Impact on Examination Frequency
 - Examination Documentation

History of Snubber Visual Examinations

- 10CFR50.55a

- 50.55a(b)(3)(v) - ...Article IWF-5000, "Inservice Inspection Requirements for Snubbers," of the ASME BPV Code, Section XI, must be used when performing in-service inspection examinations and tests of snubbers at nuclear power plants, except as conditioned in paragraphs (b)(3)(v)(A) and (B) of this section.
- (b)(3)(v)(A) ...Licensees **may use** Subsection ISTD, ASME OM Code, 1995 Edition through the latest edition and addenda in place of the requirements for snubbers in the editions and addenda up to the 2005 Addenda of the ASME BPV Code, Section XI, IWF-5200(a) and (b) and IWF-5300(a) and (b). **Preservice and inservice examinations must be performed using the VT-3 visual examination method described in IWA-2213.**
- (b)(3)(v)(B) ...Licensees **must comply** with the provisions for examining and testing snubbers in Subsection ISTD of the ASME OM Code and make appropriate changes to their technical specifications or licensee-controlled documents when using the 2006 Addenda and later editions and addenda of Section XI of the ASME BPV Code.

History of Snubber Visual Examinations

- Plants that have updated to the ISI/IST program to ASME Section XI, 2007 and later and the OM Code, 2001 thru current Edition, MUST use ISTD.
- 10CFR50.55a ties the OM (ISTD) to ASME Section XI ISI Program update requirements
 - 50.55a(f)(4) [Inservice testing standards requirement for operating plants] and 50.55a(g)(4) [Inservice inspection standards requirement for operating plants]

Additional Code Requirements that Require Visual Examination

- ISTD-1600 Snubber Modification and Replacement - Snubber replacement activities shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code, as applicable.
 - The term repair/replacement activity includes those activities known as repair, replacement, modification, or, alteration. Reasons for repair/replacement activities may include the following:
 - (a) discrepancies detected during inservice inspection, maintenance, or service
 - (b) regulatory requirements change
 - (c) design changes to improve equipment service
 - (d) changes to improve reliability
 - (e) damage
 - (f) Failure during service
 - (g) personnel exposure
 - (h) economics
 - (i) end of service life
 - (j) addition of new items or system

Additional Code Requirements that Require Visual Examination

- ASME Section XI, IWA-4000, Repair/Replacement Activities
 - The term repair/replacement activity includes those activities known as repair, replacement, modification, or, alteration. Reasons for repair/replacement activities may include the following:
 - (a) discrepancies detected during inservice inspection, maintenance, or service
 - (b) regulatory requirements change
 - (c) design changes to improve equipment service
 - (d) changes to improve reliability
 - (e) damage
 - (f) Failure during service
 - (g) personnel exposure
 - (h) economics
 - (i) end of service life
 - (j) addition of new items or system

Additional Code Requirements that Require Visual Examination

ASME Section XI, IWA-4132, Items Rotated from Stock

- For snubbers rotated from stock and installed on components (including piping systems), the following requirements may be used in lieu of all other requirements of IWA-4000, provided the rotation is only for testing or preventive maintenance of the removed items:
 - (a) Items being removed and installed shall be of the same design and construction
 - (b) Items being removed shall have no evidence of failure at the time of removal
 - (c) Items being rotated shall be removed and installed only by mechanical means
 - (d) Items being installed shall previously have been in service
 - (e) The Owner shall track the items to ensure traceability of inservice inspection and testing records
 - (f) Use of an Inspector and an NIS-2 form are not required
 - (g) Repair/replacement activities on removed items shall be performed in accordance with the requirements of this Article [IWA-4000].

Snubber Visual Examinations

- Plants that have updated to the ISI/IST program to the OM Code, 2001 thru current Edition, MUST use ISTD.
- ISTD-4100 Preservice Examination - For operating plants implementing Subsection ISTD, these requirements shall not be applicable if preservice examinations have been performed.
 - ISTD-4110 Preservice Examination Requirements
 - ISTD-4120 Reexamination
 - ISTD-4130 Preservice Thermal Movement Examination Requirements
 - ISTD-4140 Preservice Examination Corrective Actions

Snubber Visual Examinations

- OM Code, 2001 thru current Edition
 - ISTD-4200 Inservice Examination
 - ISTD-4220 Snubber Categorization
 - Typically Accessible or Inaccessible; Inside Containment or Outside Containment
 - ISTD-4230 Visual Examination Requirements
 - ISTD-4240 Operational Readiness Test Evaluation
 - ISTD-4250 Inservice Examination Intervals
 - ISTD-4260 Inservice Examination Sample Size
 - ISTD-4270 Inservice Examination Failure Evaluation
 - ISTD-4280 Inservice Examination Corrective Action

Snubber Visual Examinations: Examination Frequency

- ISTD-4250 Inservice Examination Intervals

- Table ISTD-4252-1 Visual Examination Table

- Once per Fuel Cycle (up to 24 months)

- “The basic interval shall be the normal fuel cycle up to 24 mo.

- Maximum of two fuel cycles (48 Months)

- “The examination interval may be as great as twice”

- OMN-13, Each snubber at least once every 10 years

Snubber Visual Examinations: Examination Frequency

- ISTD-4250 Inservice Examination Intervals

- Based on Safety/Safety Significant Snubber Population and number of failures during the current interval, the Examination Frequency may change.
 - The “current” interval is the “basic interval” [one fuel cycle], or maximum interval [two fuel cycles], or OMN-13 implementation [10-year interval]
- Scope Expansion for Visual Examination failure is not required, unless the number of failures during the current interval exceed Table ISTD-4252-1.

Snubber Visual Examinations

- Personnel Qualifications
 - Visual Examiners and Reviewers
 - Owner Specified Qualifications
 - ISTA-1500 Owner's Responsibilities; (e) qualification of personnel who perform and evaluate examinations and tests in accordance with the Owner's quality assurance program.
 - VT-3 – Required for ASME Section XI portion only, (Replacement and End Attachments)

Snubber Visual Examinations

- Tracking and Documenting Examinations
 - ISTD-4210 Method and Objective
 - Inservice examination shall be a visual examination to identify physical damage, leakage, corrosion, or degradation that may have been caused by environmental exposure or operating conditions. External characteristics that may indicate operational readiness of the snubber shall be examined. **An examination checklist shall be used.** Typical items are listed in Nonmandatory Appendix B of this Division.

Snubber Visual Examinations: Tracking and Documenting Examinations

- Nonmandatory Appendix B, Dynamic Restraint Examination Checklist Items
 - Pre-service Examination
 - (a) incorrect snubber load rating
 - (b) incorrect installed location
 - (c) incorrect installed orientation
 - (d) incorrect position setting
 - (e) incorrect snubber configuration
 - (f) inadequate swing clearance
 - (g) snubber installed with preset locking screws used for shipment only
 - (h) protective coverings or shipping plugs not removed

Snubber Visual Examinations

- Nonmandatory Appendix B, Dynamic Restraint Examination Checklist Items
 - Inservice Examinations
 - (a) inadequate reservoir fluid level
 - (b) loose, missing, or incorrectly installed structural connections or fasteners
 - (c) vented reservoir oriented such that hydraulic fluid cannot gravitate to snubber
 - (d) corrosion or solid deposits that could result in unacceptable snubber performance
 - (e) deformed structural attachment or piston rod
 - (f) weld arc strikes, paint, weld slag, adhesive, or other deposits on piston rod or support cylinder that could result in unacceptable snubber performance
 - (g) spherical bearing not fully engaged in attachment lug
 - (h) inadequate position setting

Snubber Visual Examinations

- Typical Examination Items
 - Mechanical Snubbers Attributes
 - lock wires
 - fillister screws
 - retaining rings (snap rings)
 - Hydraulic Snubbers Attributes
 - Fluid Connections
 - Fluid Level
 - Leakage



Iddeal Concepts, Inc.
*Intelligent. Innovative. **Iddeal.***

SnubbWorks
An Integrated Inspection Management System

Schedule Locations

OMIN-13

DATASHEETS

SnubbWorks® - a module of the IDEAL Software Suite® at Demo Nuclear Plant 1

Iddeal Software Suite®
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SnubbWorks
An Integrated Inspection Management System

Outage Unit Date
RFO23 1 10/1/2015

Setup Utilities
Databases
New Outage
Exit

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SnubbWorks®

As-Found Visual Inspection Scheduling

☒ Yes ☐ No

☒ Safety and Safety Significant ☐ Both ☐ Non Safety

☐ Schedule 100% accessible snubbers
☐ Schedule 100% inaccessible snubbers
☒ Schedule 100% accessible & inaccessible snubbers

☐ Select Manually

SELECTED	Component N	Serial No	Exam No	Mark No	Location	Line Type	Unit
☐	H10024	36563	1001	AFW-H-118	RB 277'	Safety	1
☐	M20371	18196	1002	AFW-H-13	RB 289'	Safety	1
☐	M20031	24452	1003	AFW-H-2	IB 253'	Safety	1
☐	M20001	14448	1004	AFW-H-3	IB 253'	Safety	1
☐	M20032	24453	1005	AFW-H-4	IB 253'	Safety	1
☐	M20017	20924	1006	AFW-H-5	IB 253'	Safety	1
☐	H10205	720115	1007	BS-H-370	'A' Decay Heat Pi	Safety	1
☐	H10518	720105	1008	CF-H-549	CatWalk to PZR	Safety	1
☐	M20094	8464	1009	CS-H-260	CS RLF LNS FR	Safety	1
☐	H10367	830024	1010	CS-H-287	CS PUMPS (S) D	Safety	1
☐	M20016	20880	1011	CVCS-H-18	RB 242'	Safety	1
☐	M20030	24449	1012	CVCS-H-22	RB 254'	Safety	1

Schedule Locations

OMN-13

DATASHEETS

- Scheduler
- Schedule the locations for visual examination
- Add WO's (As-Found and As-left)

SnubbWorks® - Outage / Work Scope Scheduler

Scheduler

Outage No: **SNUG 2024**
 Current Filter: **<None>**
 Records Found: **135**

Exam	Mark No	Comp No	Serial No	TPNS No	Accessible	Map No	System	Work De	AF WO	AL WO	RR Sc
1080	MS-H-59	M20249	10074	Model: PSA-1	Yes	N/A	MS	Inspect	Add AF WO/Task	Add AL WO/Task	
1074	MS-H-52	M20250	10080	Model: PSA-1	Yes	N/A	MS	Inspect			
1097	MS-H-90	M20344	10119	N/A	Yes	N/A	MS	Inspect			
1083	MS-H-62	M20332	1090	Model: PSA-1	Yes	N/A	MS	Inspect			
1105	NB-H-30	M20401	11275	Model: PSA-3	No	M140	NB	Inspect			
1040	HPCI-H-303	M20345	12434	Model: PSA-3	Yes	M448	HPCI	Inspect			
1090	MS-H-635	M20126	12672	Model: PSA-1	No	M807	MS	Inspect			
1119	RC-H-645	M20131	12681	Model: PSA-1	No	M816	RC	Inspect			
1114	RC-H-554	M20143	12709	Model: PSA-1	No	M724	RC	Inspect			
1086	MS-H-624	M20153	12733	Model: PSA-1	No	M796	MS	Inspect			
1075	MS-H-581	M20155	12738	Model: PSA-1	No	M683	MS	Inspect			
1088	MS-H-626	M20158	12741	Model: PSA-1	No	M798	MS	Inspect			
1073	MS-H-517	M20059	13155	Model: PSA-1	No	M679	MS	Inspect			
1641	MS-H-696	M20060	13156	Model: PSA-1	No	M868	MS	Inspect			
1113	RC-H-550	M20065	13163	Model: PSA-1	No	M719	RC	Inspect			
1109	PC-H-672	M20068	13167	Model: PSA-1	Yes	M844	PC	Inspect			
1103	NB-H-1	M20069	13169	Model: PSA-1	No	M1	NB	Inspect			
1110	RC-H-52	M20082	13194	Model: PSA-1	Yes	M174	RC	Inspect			
1004	AFW-H-3	M20001	14448	Model: PSA-1	Yes	N/A	AFW	Inspect			
1131	RHR-H-245	M20366	15291	Model: PSA-3	No	M390	RHR	Inspect			
1143	SI-H-111	M20368	15349	Model: PSA-3	No	N/A	SI	Inspect			
1142	SI-H-107	M20369	15765	Model: PSA-3	Yes	N/A	SI	Inspect			
1072	MS-H-51	M20370	15767	Model: PSA-3	Yes	N/A	MS	Inspect			
1067	MS-H-481	M20335	1580	Model: PSA-1	No	M641	MS	Inspect			

OMN-13 Tracking

- Last Visual Examination (Last AF Date)
 - The database will show the last time a datasheet was created for each location (Safety, Safety Significant, and Non-Safety)
- Next Visual Examination (Next AF Date)
 - The database will show the due date for the next examination, Last AF date plus 10 years) for each location (Safety, Safety Significant, and Non-Safety)
- If the components are scheduled in the current outage, the “As-found” column will have **“Yes”** and the VT Scope column will have a Work Scope displayed

OMN-13 Tracking

1. Planner;
2. Visual Inspection
3. Select the “Previous Locations AF Visuals” icon

DATASHEETS

SnubbWorks® - Visual Inspection Details

Visual Exams

Outage No./Work Scope: SNUG 2024
Current Filter: <None>
Records Found: 135

As Found		As Left		PSI		Failures		All				
Exam	Mark No	Comp P	Serial N	A	System	Line No	Map P	RI	Tt	AF	AL	VT
1001	AFW-H-118	H10024	36563	No	AFW	Safety	N/A	No	No	Yes	No	
1002	AFW-H-13	M20371	18196	No	AFW	Safety	N/A	No	No	Yes	No	
1003	AFW-H-2	M20031	24452	Yes	AFW	Safety	N/A	No	No	Yes	No	
1004	AFW-H-3	M20001	14448	Yes	AFW	Safety	N/A	No	No	Yes	No	
1005	AFW-H-4	M20032	24453	Yes	AFW	Safety	N/A	No	No	Yes	No	
1006	AFW-H-5	M20017	20924	Yes	AFW	Safety	N/A	No	No	Yes	No	
1007	BS-H-370	H10205	720115	Yes	BS	Safety	M9	No	No	Yes	No	
1008	CF-H-549	H10518	720105	No	CF	Safety	M8	No	No	Yes	No	
1009	CS-H-260	M20094	8464	Yes	CS	Safety	M405	No	No	Yes	No	
1010	CS-H-287	H10367	830024	Yes	CS	Safety	M432	No	No	Yes	No	
1011	CVCS-H-18	M20016	20880	No	CVCS	Safety	N/A	No	No	Yes	No	
1012	CVCS-H-22	M20030	24449	No	CVCS	Safety	N/A	No	No	Yes	No	
1013	CVCS-H-23	M20392	25432	No	CVCS	Safety	N/A	No	No	Yes	No	
1014	CVCS-H-24	M20003	16541	No	CVCS	Safety	N/A	No	No	Yes	No	
1015	CVCS-H-25	M20122	9483	No	CVCS	Safety	N/A	No	No	Yes	No	
1016	DH-H-380	H10260	760027	Yes	DH	Safety	M15	No	No	Yes	No	
1017	DH-H-544	H10401	730216	No	DH	Safety	M1	No	No	Yes	No	
1018	DU-H-592	H10515	720098	No	DU	Safety	M1	No	No	Yes	No	

SNUG 2024

- Scheduler
- Planner
- Datasheets
- Reviews
- Drawings
- Spares
- Close

- Repair & Rebuild
- Functional Test
- Visual Inspection
- Augmented Samples
- Review Plan

OMN-13 Tracking

DATASHEETS

SnubbWorks®

Previous As Found Visuals

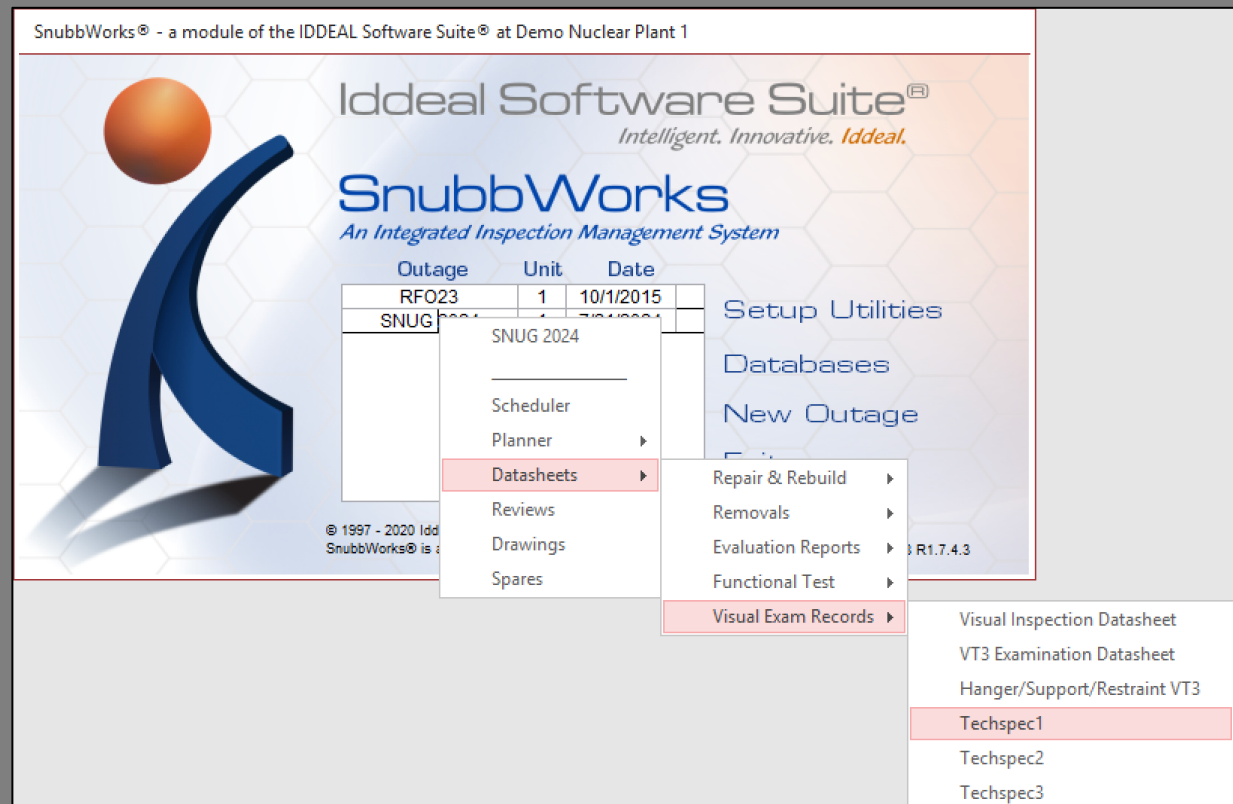
Work Scope:
 Current Filter: <None>
 Records Found: 172

Mark No	Exam No	Serial No	Current Serial No	Last AF Date	Last AF Resu	Next AF Date	As Found	VT Scope	ASME Class	
AFW-H-118	1001	730015	36563	10/30/2010	S	10/30/2020	Yes		2	F
AFW-H-118	1001	730015	36563	10/30/2010	S	10/30/2020	Yes	100%	2	F
AFW-H-13	1002	18196	18196	10/29/2012	S	10/29/2022	Yes	100%	2	F
AFW-H-13	1002	18196	18196	10/29/2012	S	10/29/2022	Yes		2	F
AFW-H-2	1003	24452	24452	4/28/2011	S	4/28/2021	Yes	100%	3	I
AFW-H-3	1004	12743	14448	3/27/2012	S	3/27/2022	Yes	100%	3	I
AFW-H-4	1005	24453	24453	4/28/2011	S	4/28/2021	Yes	100%	3	I
AFW-H-5	1006	20959	20924	10/31/2010	S	10/31/2020	Yes	100%	3	I
BS-H-370	1007	750102	720115	10/5/2007	S	10/5/2017	Yes	100%	2	I
CF-H-549	1008	22400	720105	10/31/2010	S	10/31/2020	Yes	100%	1	C
CS-H-260	1009	6828	8464	3/27/2012	S	3/27/2022	Yes	100%	2	C
CS-H-287	1010	810149	830024	4/8/2012	S	4/8/2022	Yes	100%	2	C
CVCS-H-18	1011	20880	20880	5/9/2011	S	5/9/2021	Yes	100%	1	F
CVCS-H-22	1012	24449	24449	5/6/2011	S	5/6/2021	Yes	100%	1	F
CVCS-H-23	1013	11266	25432	11/3/2010	S	11/3/2020	Yes	100%	2	F
CVCS-H-24	1014	16541	16541	4/26/2011	S	4/26/2021	Yes	100%	2	F
CVCS-H-25	1015	9483	9483	5/3/2011	S	5/3/2021	Yes	100%	2	F
DH-H-380	1016	820014	760027	4/3/2012	NA	4/3/2022	Yes	100%	2	I
DH-H-544	1017	730216	730216	10/6/2007	S	10/6/2017	Yes	100%	2	L
DH-H-582	1018	19909	720098A	3/29/2012	S	3/29/2022	Yes	100%	2	L
DH-H-582	1018	19909	720098A	3/29/2012	S	3/29/2022	Yes		2	L
DH-H-590	1019	13156	720130	10/30/2010	S	10/30/2020	Yes	100%	3	V
EF-H-379	1020	9866	760108	10/9/2007	S	10/9/2017	Yes	100%	4	E
EF-H-379	1020	9866	760108	10/9/2007	S	10/9/2017	Yes		4	E
FW-H-125	1021	2500-10-152	2500-10-152	5/3/2011	S	5/3/2021	Yes	100%	2	F
FW-H-126	1022	2500-10-153	2500-10-153	5/5/2011	S	5/5/2021	Yes	100%	2	F
FW-H-127	1023	G15200-1	G15200-1	5/6/2011	S	5/6/2021	Yes		Q	I

Create Data Sheets – Tech Spec 1

1. Datasheets;
2. Visual Exam Records
3. TechSpec1

- TechSpec1 – Designed to cover the OM Code Examination Boundary

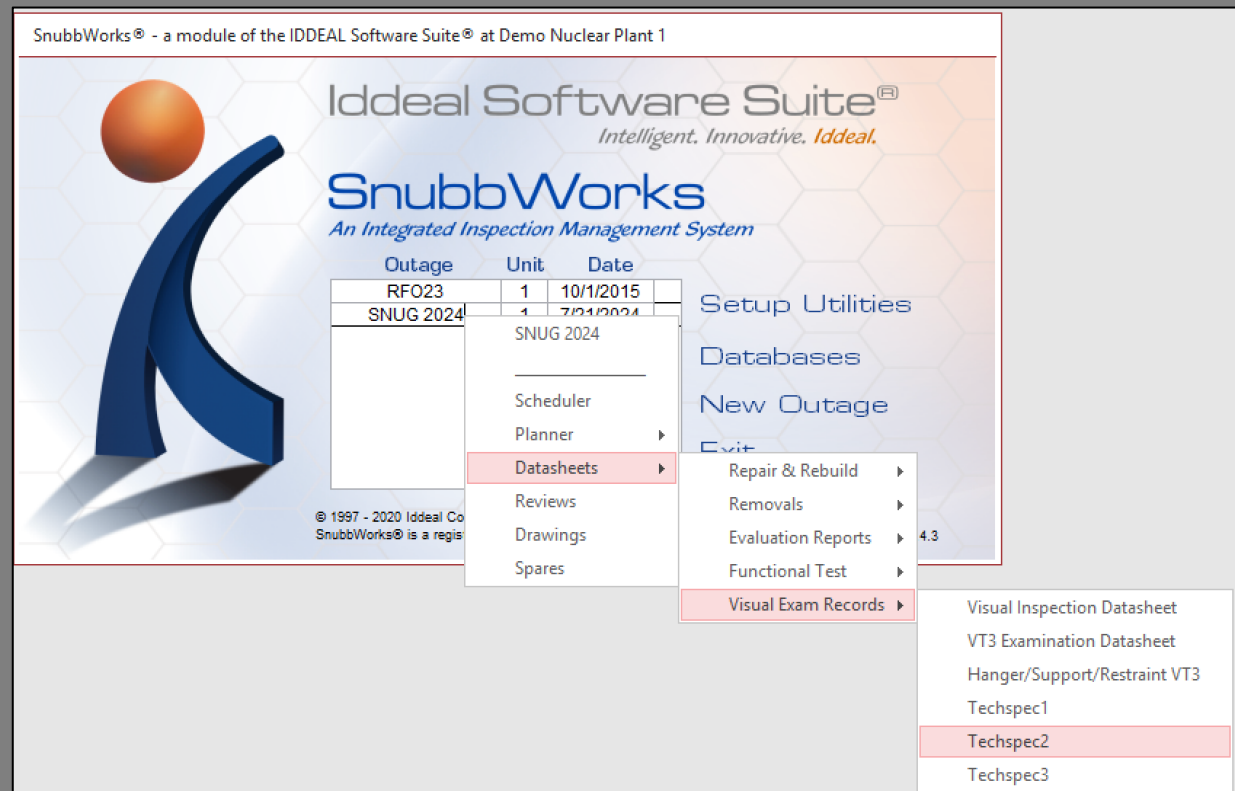


Snubber Visual Examination				Test Plant Unit 2 Report No: SNUG 2-VT3-0001 Page 1 of 1
Plant/Unit: DE1 / 1		Outage No: SNUG 2024		☒ As Found ☐ As Left ☐ PSI
Procedure No: PROC-003		Revision: 1		WO/WR No: N/A
Exam No: 1002		Building/Room: RB / N/A		Component No: M20371
Mark No: AFW-H-13		Serial No: 18196		
System: AFW		Elevation: 289'		Manufacturer: Mechanical
Line No: Safety		Row/Column: N/A		Model: PSA-3
TPNS No: Model: PSA-3		Map No: N/A		Size: 3
Resolution	Technique	Lighting	Tools	
Other - See Comments				
GENERAL : Component support identified ☐ Sat ☐ Unsat ☒ N/A Component installed / orientated per design ☐ ☐ ☒		LINKAGE CONNECTIONS / ATTACHMENTS : ☐ Sat ☐ Unsat ☒ N/A Attachment items not bent / damaged / deformed ☐ ☐ ☒ Snubber attachments / connections not loose ☐ ☐ ☒ Broken / missing cotter pins / load pins / snap rings ☐ ☐ ☒ No loose / missing parts / locknuts ☐ ☐ ☒ Close tolerance surface / corrosion ☐ ☐ ☒ Anchor points for binding / excess movement ☐ ☐ ☒ End attachment gaps and tolerances ☐ ☐ ☒		
FLUID CONNECTIONS : Fluid connections and seals loose / leaking ☐ ☐ ☒ Assembly / valve block / body / fittings leaking ☐ ☐ ☒ Piston rod and associated seal ☐ ☐ ☒ Reservoir sightglass / cracks / leaking ☐ ☐ ☒ Reservoir shipping plug not installed ☐ ☐ ☒ Reservoir orientation / vent port at top ☐ ☐ ☒ Fluid clarity / no suspended solids ☐ ☐ ☒ Fluid Level: _____ ☐ ☐ ☒		SNUBBER MEASUREMENTS : System Temperature: ☐ Hot ☐ Cold _____ Piston Rod Setting: _____ Pin to Pin Setting: _____ Supplemental data attached: ☐ Yes ☒ No		
Comments:				
Examiner Name: _____		Level: _____		Exam Date: _____
Examiner Name: _____		Level: _____		Exam Date: _____
EXAMINATION EVALUATION AND OVERVIEW				
There are no signs of damage or impaired operability.				☐ Sat ☐ Unsat ☒ N/A
Attachments to the supporting structure are secure.				☐ ☐ ☐ ☐
Fasteners for the attachment of the snubber to the component and to the snubber are functional.				☐ ☐ ☐
OVERALL RESULTS: ☐ SAT ☐ DEGRADED ☐ UNSAT				
NOA/AR/CR Issued: _____ WO/WR Issued: _____				
EVALUATION COMMENTS:				
Reviewed By: _____		Level: _____		Date: _____
Reviewed By: _____		Level: _____		Date: _____

Create Data Sheets – Tech Spec 2

1. Datasheets;
2. Visual Exam Records
3. TechSpec2

- TechSpec2 – Designed to cover ASME Section XI and OM Code Boundaries



SnubberWorks® - Tech Spec Visual Inspection Report

☐ As Found ☐ As Left ☐ PSI

Plant/Unit: DE1 / Outage No.: SNUG 2024 Report No.: 1 - 1

Procedure No.: Revision No.: Comp No.: Exam No.: Building/Room: Serial No.: Mark/Hanger No.: Elevation: Manufacturer: System: Row/Col. No.: Model: Line No.: Map No.: Size: WO/WR No.:

Resolution	Technique	Lighting	Tools
Other - See Comments			

	Sat	Unsat	N/A		Sat	Unsat	N/A
Component support identified	☐	☐	☒	Movement obstructions	☐	☐	☒
Component installed / orientated per design	☐	☐	☒	Close tolerance surface / corrosion	☐	☐	☒
No signs of physical damage	☐	☐	☒	Corrosion / material / scratches on piston rod	☐	☐	☒
Structural steel attachments / embedment plates	☐	☐	☒	Reservoir sightglass	☐	☐	☒
Attachment items not bent / damaged / deformed	☐	☐	☒	Fluid connections and seals loose / leaking	☐	☐	☒
Snubber attachments / connections not loose	☐	☐	☒	Assembly / valve block / body / fittings leaking	☐	☐	☒
Broken / missing cotter pins / load pins / snap rings	☐	☐	☒	Reservoir shipping plug not installed	☐	☐	☒
No signs of weak, stripped threads	☐	☐	☒	Vent not obstructed or damaged	☐	☐	☒
No loose / missing parts / locknuts	☐	☐	☒	Reservoir orientation / vent port at top	☐	☐	☒
Supporting structure and foundations	☐	☐	☒	Fluid clarity / no suspended solids	☐	☐	☒
Concrete anchors	☐	☐	☒	Fluid Level:	☐	☐	☒
No cracked / chipped concrete / grout	☐	☐	☒	Pin to Pin Setting:	☐	☐	☒
Weld integrity	☐	☐	☒	Piston Rod Setting:	☐	☐	☒
Spherical bearings functional	☐	☐	☒	System Temperature: ☐ Hot ☒ Cold	☐	☐	☒
End attachment gaps and tolerances	☐	☐	☒	Supplemental data attached: ☐ Yes ☒ No	☐	☐	☒
Anchor points for binding / excess movement	☐	☐	☒				

Comments:

Examiner Name: Level: Exam Date:

Examiner Name: Level: Exam Date:

EXAMINATION EVALUATION AND OVERVIEW

There are no signs of damage or impaired operability ☐ ☐ ☐

Attachments to the supporting structure are secure ☐ ☐ ☐

Fasteners for the attachment of the snubber to the component and to the snubber are functional. ☐ ☐ ☐

OVERALL RESULTS: ☐ SAT ☐ DEGRADED ☐ UNSAT

NCR/AR/CR Issued: WO/WR Issued:

EVALUATION COMMENTS:

Reviewed By: Level: Date:

Reviewed By: Date:

Snubber Visual Examination

Test Plant Unit 2 Report No: SNUG 2-VT3-0002 Page 1 of 1

Plant/Unit: DE1 / 1 Outage No: SNUG 2024 ☒ As Found ☐ As Left ☐ PSI

Procedure No: PROC-003 Revision: 1 WO/WR No: N/A

Exam No: 1003 Building/Room: IB / N/A Component No: M20031

Mark No: AFW-H-2 Serial No: 24452

System: AFW Elevation: 253' Manufacturer: Mechanical

Line Type: Safety Row/Column: N/A Model: PSA-1

WO/WR No: N/A Map No: N/A Size: 1

Resolution	Technique	Lighting	Tools
Other - See Comments			

	Sat	Unsat	N/A		Sat	Unsat	N/A
Component support identified	☐	☐	☒	Movement obstructions	☐	☐	☒
Component installed / orientated per design	☐	☐	☒	Close tolerance surfaces / corrosion	☐	☐	☒
No signs of physical damage	☐	☐	☒	Corrosion / material / scratches on piston rod	☐	☐	☒
Structural steel attachments / embedment plates	☐	☐	☒	Reservoir sightglass	☐	☐	☒
Attachment items not bent / damaged / deformed	☐	☐	☒	Fluid connections and seals loose / leaking	☐	☐	☒
Snubber attachments / connections not loose	☐	☐	☒	Assembly / valve block / body / fittings leaking	☐	☐	☒
Broken / missing cotter pins / load pins / snap rings	☐	☐	☒	Reservoir shipping plug not installed	☐	☐	☒
No signs of weak, stripped threads	☐	☐	☒	Vent not obstructed or damaged	☐	☐	☒
No loose / missing parts / locknuts	☐	☐	☒	Reservoir orientation / vent port at top	☐	☐	☒
Supporting structure and foundations	☐	☐	☒	Fluid clarity / no suspended solids	☐	☐	☒
Concrete anchors	☐	☐	☒	Fluid Level:	☐	☐	☒
No cracked / chipped concrete / grout	☐	☐	☒	Pin to Pin Setting:	☐	☐	☒
Weld integrity	☐	☐	☒	Piston Rod Setting:	☐	☐	☒
Spherical bearings functional	☐	☐	☒	System Temperature: ☐ Hot ☒ Cold	☐	☐	☒
End attachment gaps and tolerances	☐	☐	☒	Supplemental data attached: ☐ Yes ☒ No	☐	☐	☒
Anchor points for binding / excess movement	☐	☐	☒				

Comments:

Examiner Name: Level: Exam Date:

Examiner Name: Level: Exam Date:

EXAMINATION EVALUATION AND OVERVIEW

There are no signs of damage or impaired operability. ☐ ☐ ☐

Attachments to the supporting structure are secure. ☐ ☐ ☐

Fasteners for the attachment of the snubber to the component and to the snubber are functional. ☐ ☐ ☐

OVERALL RE SULTS: ☐ SAT ☐ DEGRADED ☐ UNSAT

NOA/AR/CR Issued: WO/WR Issued:

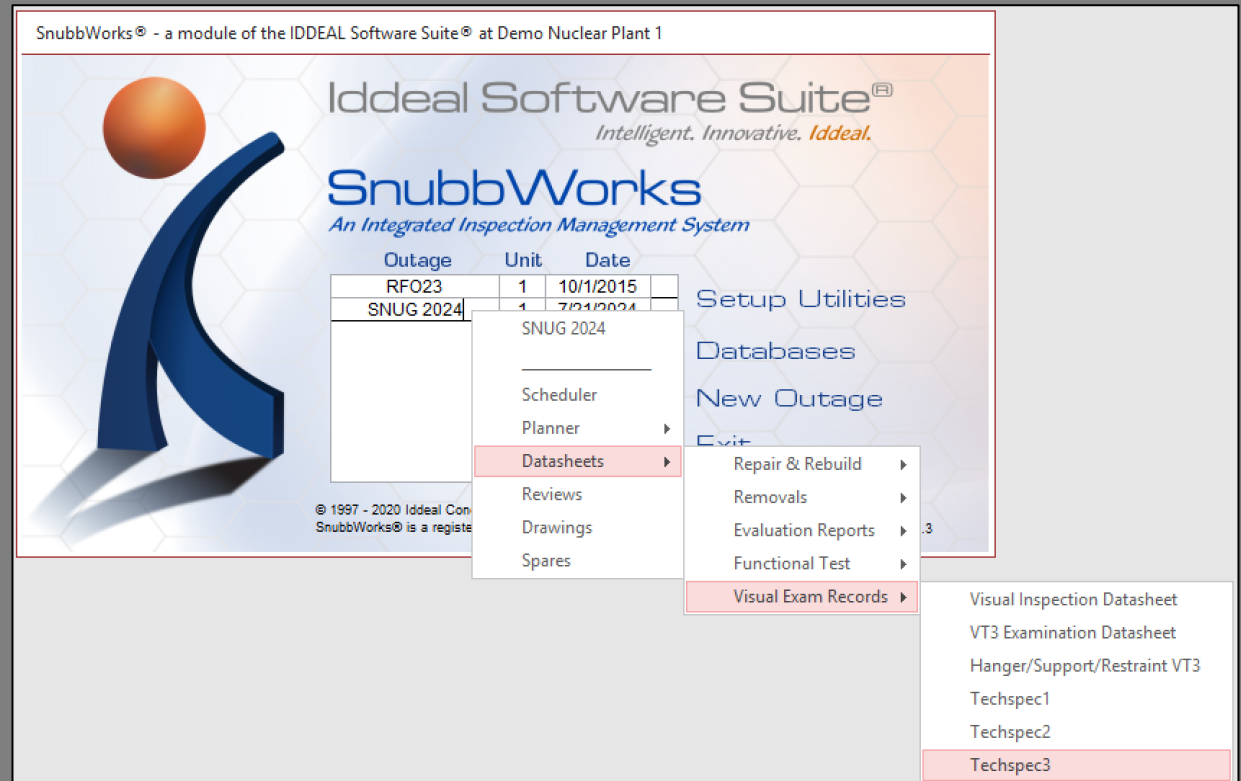
EVALUATION COMMENTS:

Reviewed By: Level: Date:

Reviewed By: Date:

Create Data Sheets – Tech Spec 3

1. Datasheets;
2. Visual Exam Records
3. TechSpec3
 - TechSpec3 – Designed to cover OM Code Boundaries. Requires “Settings” to be populated for auto calculations of allowable Piston Settings



Plant/Unit: DE1 / 1		Outage No: SNUG 2024	☒ As Found ☐ As Left ☐ PSI	
Procedure No: PROC-003		Revision: 1	WO/WR No: N/A	
Exam No: 1003		Building/Room: IB / N/A		Component No: M20031
Mark No: AFW-H-2				Serial No: 24452
System: AFW		Elevation: 253'		Manufacturer: Mechanical
Line Type: Safety		Row/Column: N/A		Model: PSA-1
WO/WR No: N/A		Map No: N/A		Size: 1

Resolution	Technique	Lighting	Tools
Other - See Comments			

	Sat	Unsat	N/A		Sat	Unsat	N/A
Component support identified	☐	☐	☒	Movement obstructions	☐	☐	☒
Component installed / orientated per design	☐	☐	☒	Close tolerance surfaces / corrosion	☐	☐	☒
No signs of physical damage	☐	☐	☒	Corrosion / material / scratches on piston rod	☐	☐	☒
Structural steel attachments / embedment plates	☐	☐	☒	Reservoir sightglass	☐	☐	☒
Attachment items not bent / damaged / deformed	☐	☐	☒	Fluid connections and seals loose / leaking	☐	☐	☒
Snubber attachments / connections not loose	☐	☐	☒	Assembly / valve block / body / fittings leaking	☐	☐	☒
Broken / missing cotter pins / load pins / snap rings	☐	☐	☒	Reservoir shipping plug not installed	☐	☐	☒
No signs of wear, stripped threads	☐	☐	☒	Vent not obstructed or damaged	☐	☐	☒
No loose / missing parts / locknuts	☐	☐	☒	Reservoir orientation / vent port at top	☐	☐	☒
Supporting structure and foundations	☐	☐	☒	Fluid clarity / no suspended solids	☐	☐	☒
Concrete anchors	☐	☐	☒	Fluid Level: _____	☐	☐	☒
No cracked / chipped concrete / grout	☐	☐	☒	Pin to Pin Setting: _____			
Weld integrity	☐	☐	☒	Piston Rod Setting: _____			
Spherical bearings functional	☐	☐	☒	System Temperature: ☐ Hot ☒ Cold _____			
End attachment gaps and tolerances	☐	☐	☒	Supplemental data attached: ☐ Yes ☒ No			
Anchor points for binding / excess movement	☐	☐	☒				

Comments:

Examiner Name: _____	Level: _____	Exam Date: _____
Examiner Name: _____	Level: _____	Exam Date: _____

EXAMINATION EVALUATION AND OVERVIEW	Sat	Unsat	N/A
There are no signs of damage or impaired operability.	☐	☐	☐
Attachments to the supporting structure are secure.	☐	☐	☐
Fasteners for the attachment of the snubber to the component and to the snubber are functional.	☐	☐	☐
OVERALL RESULTS: ☐ SAT ☐ DEGRADED ☐ UNSAT			

NOA/IR/CR Issued: _____ WO/WR Issued: _____

EVALUATION COMMENTS:

Reviewed By: _____	Level: _____	Date: _____
Reviewed By: _____		Date: _____

Settings needed for Tech Spec 3

SnubbWorks® - Location Details

Location

Retired: ☐ Date: DCN/WO:

Location Detail | Service Conditions | Scaffolding / Insulation | Settings

Identification:

Exam No.: Tandem: ☐

Hanger/Mark No.:

Location:

Description:

Plant System:

Unit: RHR Common:

System:

Loop:

Line Safety/ Non-Safety:

Line Desc.:

Train:

Flow Path:

Location Category:

Tech. Spec.: ☒

ASME Class:

Settings:

Design Pin to Pin - Hot:

Design Pin to Pin - Cold:

Max. recorded Pin Setting:

Min. recorded Pin Setting:

Piston Setting (cold set):

Piston Setting (hot set):

Design Min. Piston Setting:

Design Max. Piston Setting:

Thermal Movement Comp:

Thermal Movement Tens:

Orientation:

Vent:

Fitting:

Valve Block No/Type:

Remote Reservoir:

Extension Piece:

Pipe Clamp:

Clamp Insulated:

Load Stud or Pin:

Double nutted:

Staked:

Analytical Sub:

Analytical Dwg:

Deflector Cover:

Rear Bracket:

Load Stud or Pin:

Double nutted:

Staked:

Plant/Unit		Outage No	Exam No	
DE1 / 1		SNUG 2024	1004	
Procedure No		Revision:	☒ As Found ☐ As Left ☐ PSI	
PROC-003		1		
Location :		Building/Room	Component No	
IB 253'		IB / N/A	M20001	
Mark No		Serial No		Manufacturer
AFW-H-3		14448		Mechanical
System:		Elevation:	Model:	
AFW		253'	PSA-1	
Line No		Row/Column	Size/Stroke:	
Safety		N/A	1/4	
WO/WR No		Map No	Size/Stroke:	
N/A		N/A	1/4	

Resolution	Technique	Lighting	Tools
Other - See Comments			

FLUID CONNECTIONS :	Sat	Unsat	N/A	SNUBBER MEASUREMENTS :	Cold
Fluid connections and seals loose / leaking	☐	☐	☒	Design Piston Set	2.75 As Measured 2.5
Assembly / valve block / body / fittings leaking	☐	☐	☒	Zero Adjustment	0 Therm. Move(C) 0
Piston rod and associated seal	☐	☐	☒	Recorded Setting	2.5 Therm. Move(T) 0.875
Reservoir sightglass / cracks / leaking	☐	☐	☒	Available Movement (C)	0.5 < 2.500 < 4.5
Fluid Level	☐	☐	☒	Available Movement (T)	0.5 < 3.375 < 4.5
LINKAGE CONNECTIONS / ATTACHMENTS :				Available Movement Acceptable	☒ Yes ☐ No
Attachment items not bent / damaged / deformed	☐	☐	☒	For Cold Piping: 0 < [as-measured - the "Zero adjustment" [either + thermal movement (T) or - thermal movement (C) < Max. snubber stroke. For Hot Piping: 0 < [as-measured - the "Zero adjustment" [either - thermal movement (T) or + thermal movement (C) < Max. snubber stroke.	
Snubber attachments / connections not loose	☐	☐	☒		
Broken / missing cotter pins / load pins	☐	☐	☒		
No Loose / missing parts	☐	☐	☒		
Close tolerance surface / corrosion	☐	☐	☒		
Anchor points for binding / excess movement	☐	☐	☒		
End attachment gaps and tolerances / locknuts	☐	☐	☒		
Other	☐	☐	☒		

Comments

Examiner Name: _____	Level: _____	Exam Date: _____
Examiner Name: _____	Level: _____	Exam Date: _____

EXAMINATION EVALUATION AND OVERVIEW	Sat	Unsat	N/A
There are no signs of damage or impaired operability	☐	☐	☐
Attachments to the supporting structure are secure	☐	☐	☐
Fasteners for the attachment of the snubber to the component and to the snubber are functional.	☐	☐	☐
OVERALL RESULTS: ☐ SAT ☐ DEGRADED ☐ UNSAT	Supplemental data attached: ☐ Yes ☒ No		

CR Initiated: _____

WO/Notification: _____

EVALUATION COMMENTS:

Reviewed By: _____	Level: _____	Date: _____
Reviewed By: _____		Date: _____

Review Data Sheets

- Datasheet Reviews
 - SAT – Meets all of the examination criteria
 - DEGRADED – Not fully satisfactory, but still evaluated to functional (i.e., less than 50% fluid); Condition SHOULD be corrected to be fully functional
 - UNSAT – Did not meet the functional requirements; Condition MUST be corrected or snubber replaced [ISTD-4280]
 - Schedule UNSAT for Functional Testing

Review Data Sheets

EXAMINATION EVALUATION AND OVERVIEW		Sat	Unsat	N/A
There are no signs of damage or impaired operability		☐	☐	☐
Attachments to the supporting structure are secure		☐	☐	☐
Fasteners for the attachment of the snubber to the component and to the snubber are functional.		☐	☐	☐
OVERALL RESULTS: ☐ SAT ☐ DEGRADED ☐ UNSAT				
CR Initiated:				
WO/Notification:				
EVALUATION COMMENTS:				
Supplemental data attached: ☐ Yes ☒ No				
Reviewed By:		Level	☐	Date
Reviewed By:				Date
          				

History Module

- Updating History
 - After the examination datasheets have been reviewed, the History can be updated
 - The information will be captured in three locations:
 - History database
 - Location Database (for the individual Location), and
 - Snubber Database (for the individual Snubber Serial Number)

History Module

SnubbWorks® - History Details

History

Current Filter: <User Defined>
Records Found: 21

UNIT	OUTAGE_NO	EXAM_NO	MARK_NO	COMPONENT_NO	SERIAL_NO	MANUFACTURER	MODEL	SIZE	STROKE	RATED_LOAD	
1	1989	1004	AFW-H-3	M20001	14448	Mechanical	PSA-1	1	4	1500	AI
1	1995	1004	AFW-H-3	M20001	14448	Mechanical	PSA-1	1	4	1500	AI
1	1995	1004	AFW-H-3	M20001	14448	Mechanical	PSA-1	1	4	1500	AI
1	1996	1004	AFW-H-3	M20001	14448	Mechanical	PSA-1	1	4	1500	AI
1	1999	1004	AFW-H-3	M20001	14448	Mechanical	PSA-1	1	4	1500	AI
1	2002	1004	AFW-H-3	M20001	14448	Mechanical	PSA-1	1	4	1500	AI
1	2003	1004	AFW-H-3	M20001	14448	Mechanical	PSA-1	1	4	1500	AI
1	RFO03	1004	AFW-H-3	H10527	750046	Hydraulic 1	4 x 5	4	5	28200	AI
1	RFO04	1004	AFW-H-3	H10527	750046	Hydraulic 1	4 x 5	4	5	28200	AI
1	RFO06	1004	AFW-H-3	H10527	750046	Hydraulic 1	4 x 5	4	5	28200	AI
1	RFO07	1004	AFW-H-3	H10527	750046	Hydraulic 1	4 x 5	4	5	28200	AI
1	RFO08	1004	AFW-H-3	H10527	750046	Hydraulic 1	4 x 5	4	5	28200	AI
1	RFO10	1004	AFW-H-3	H10527	750046	Hydraulic 1	4 x 5	4	5	28200	AI
1	RFO11	1004	AFW-H-3	H10527	750046	Hydraulic 1	4 x 5	4	5	28200	AI
1	RFO12	1004	AFW-H-3	H10527	750046	Hydraulic 1	4 x 5	4	5	28200	AI
1	RFO12	1004	AFW-H-3	M20131	12681	Mechanical	PSA-1/4	0.25	4	350	AI
1	RFO13	1004	AFW-H-3	H10527	750046	Hydraulic 1	4 x 5	4	5	28200	AI
1	RFO13	1004	AFW-H-3	H10527	750046	Hydraulic 1	4 x 5	4	5	28200	AI
1	RFO17	1004	AFW-H-3	H10527	750046	Hydraulic 1	4 x 5	4	5	28200	AI
1	RFO18	1004	AFW-H-3	M20001	14448	Mechanical	PSA-1	1	4	1500	AI
1	RFO19	1004	AFW-H-3	M20159	12743	Mechanical	PSA-1/4	0.25	4	350	AI

Outage No. All



SnubbWorks
An Integrated Inspection Management System

History Module

SnubbWorks®

History Data

History Found Left Memo

SNUBBER_ID

H10527

LOCATION_ID

AFW-H-3

OUTAGE_NO

RFO17

NEW SNUBBER_ID

Serial No

750046

New Serial No

FT_Date_AF

11/5/2010

FT_Date_AL

AF_Date

10/27/2010

RB_Date

AL_Date

PSI_Date

PSI

SAT

PLAN

10%

FUNC_TEST_AF

SAT

FUNC_TEST_AL

AS FOUND VISUAL

SAT

REBUILD

AS LEFT VISUAL

NOA_NO

NOA_DATE

DATE_INSTALLED

11/1/2001

AF PISTON_SET

AF PIN_TO_PIN

AF RES_LEVEL

AL PISTON_SET

AL PIN_TO_PIN

AL RES_LEVEL

REMOVAL_DATE

11/5/2010

⏪

⏩

⏴

⏵

📄

📁

✖

History Module

SnubbWorks® - Exam Details

Snubber

Component No:

Serial No:

TPNS No:

Manufacturer:

Model/Type:

Size:

Rated Load:

Drawing Type	Drawing Name

Location

Exam No.:

Mark No.:

Location:

Description:

ASME Class: Accessible: ☒

Category: Tech. Spec.: ☒

System:

Line Type:

Unit: Building:

Elevation: Room:

Quadrant: Map No.:

Drawing Type	Drawing Name



History Module

SnubbWorks® - Examination and Inspection History

Component No.:
 Serial No.:
 Manuf./Model:

View: ☒ All Results
☐ Functional Test Results

Outage	Exam/Mark No	Rebuild	AF Test	AL Test	As Found	As Left	VT3	NOA Date	NOA No
1989	1004 AFW-H-3								
1995	1004 AFW-H-3								
1995	1004 AFW-H-3								
1996	1004 AFW-H-3								
1S99	1004 AFW-H-3								
2002	1004 AFW-H-3								
2003	1004 AFW-H-3								
RFO18	1004 AFW-H-3								

SnubbWorks® - Location History

Exam No.:
 Hanger/Mark No.:
 Location:

Outage	Serial No	Rebuild	AF Test	AL Test	As Found	As Left	PSI	NOA Date	NOA No
RFO11	750046								
RFO12	750046								
RFO12	12681					11/2/2007 S			
RFO13	750046					4/25/2009 S			
RFO13	750046								
RFO17	750046		11/5/2010 S		10/27/2010 S		S		
RFO18	14448				4/28/2011 S	4/28/2011 S			
RFO19	12743				3/27/2012 S				

	Total							
Sat	0	1	0	3	6	1	11	
Degraded	0	0	0	0	0	0	0	
UnSat	0	0	0	0	0	0	0	



In Review

- Why
 - To ensure Operational Readiness of the Snubber on safety-related systems
 - It is required by the Plant Operating License (Tech Specs or TRM)
 - It is the Law
- Requirements
 - ISTA and ISTD
 - ASME Section XI
- Documentation – *it isn't complete unless it is documented*
 - Checklist for the inspections

Fin

We will now take your questions



Roles for groups

- Corporation:
- Site:
- Corporate Engineer:
- Site Engineer:
- Planner:
- Performer/Performing org:

- Corporation: TVA
- Site: WBN
- Corporate Engineer: Outage Scope, procedure updates, Outage support, teach pre-outage class for pipefitters.
- Site Engineer: NA
- Planner: Planning including spares, tracking spares, post outage package, scaffold requests
- Performer/Performing org: Removes/Reinstalls, vendors

- Corporation: TVA
- Site: SQN
- Corporate Engineer: Outage Scope, procedure updates, Outage support, post outage package, A few signoffs for outage paperwork, teach pre-outage class for pipefitters.
- Site Engineer: NA
- Planner: Planning including Parts for hydraulic rebuilds (no drop/swaps so spares aren't done), scaffold requests
- Performer/Performing org: Removes/Reinstalls, vendors

- Corporation: TVA
- Site: BFN
- Corporate Engineer: Outage Scope, procedure updates, Outage support, post outage package, Tons of signoffs for outage paperwork, Determine spares (including TIICS, UNIDS, previous locations), challenge meetings, 7+ actions to verify POs in place (BFN only actions and I am not over them), write WOs for outages,
- Site Engineer: NA
- Planner: Planning including Parts for hydraulic rebuilds, scaffold requests
- Performer/Performing org: Removes/Reinstalls, vendors, teach pre-outage class for pipefitters.

Lunch Sponsored By



RETURN BY 1:00 PM

ADMINISTRATIVE ITEMS

SCOTT ESPOSITO

- Logistics
- Agenda Overview
 - Conference Planning Committee Report
 - Plant Mod Requirements
 - Train Related Outages
 - Question & Answer Session
 - Afternoon Break
 - **Utility representatives only closed session**





Conference Planning Committee Report

Committee Members

- Steve Norman, Chair
- Scott Esposito, Ex-Officio Member
- Mitch Etten-Bohm, Standing Member
- Tim Canter, Standing Member
- Bob Fandetti, Standing Member
- Gus Avila, Standing Member
- John Knezevic (Curtiss-Wright), Summer 2024
- Riley Smith (Curtiss-Wright), Summer 2024
- Grant Nelson (ASC-ES), Summer 2025



Summer 2025 SNUG

Sponsored by:



and



Summer 2025 SNUG



The DeSoto Hotel

Savannah, Georgia

July 14, 15 & 16, 2025

Room Rate for Standard Rooms: \$185.00

Summer 2025 SNUG

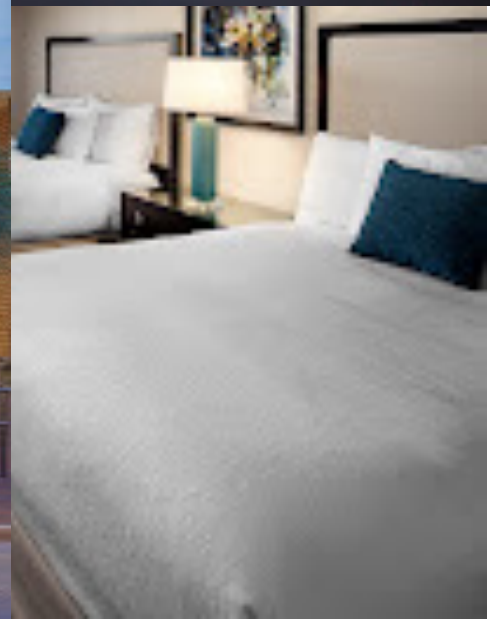
The DeSoto Hotel

15 East Liberty Street, Savannah, GA 31401

Reservations: (912) 232-9000

Room Rate: \$185.00





Hotel Dining

- **Edgar's Proof & Provision**

Edgar's Proof & Provision is an old-fashioned community drinkery offering a selection of 120+ whiskeys, including the private label "Edgar's Truth" bourbon. With indoor and outdoor seating, guests can enjoy a refreshing beverage with Southern comfort food for breakfast, lunch, or dinner. The casual dining menu features locally sourced charcuterie, and favorites such as grilled cheese sandwiches and Southern chicken biscuits served with tomato and jalapeño jam.

- **1540 Room**

Unpretentious and inventive, the 1540 Room delivers a locally sourced culinary experience rich in Savannah traditions. The 1540 Room is one of the only restaurants in Savannah that offers an open-concept show kitchen, sharing the same space as the dining area. Follow the bubbling conversation to the heart of Savannah's historic district and indulge in artistic, Southern-infused cuisine and decadent desserts. Locally sourced with a hands-on focus, 1540 dishes are perfectly paired with cocktails and select wines. The result: an invigorating dining experience that leaves guests satisfied to the core.

- **Buffalo Bayou Coffee**

Located in the lobby, Buffalo Bayou Coffee serves local Savannah Coffee Roasters brews alongside gourmet-to-go light fare. Savor the signature Honeybee Latte made with Local Honey with a breakfast sandwich or grab Southern-style fare like Pimento Cheese & Bacon Biscuits and Turkey & Garden Tomato Clubs to go.

40th Anniversary

The first official conference of SNUG was held in Charlotte, North Carolina during the summer of 1985. SNUG celebrated our 20th anniversary with a huge conference in 2005 and invited as many members from the past as we could find. We plan to repeat that by once again inviting as many past SNUG members as we can contact. So, if there is someone at your place of business that was involved with snubbers at one time but has now moved on to other assignments or has retired but you still know how to contact them, please let them know of our plans and also please make sure to send us their contact information.

That being said, when registration opens up for the Summer 2025 SNUG Conference & Trade Show, **MAKE YOUR HOTEL RESERVATIONS.**

DO NOT WAIT!!!

Future Conference Sponsorship

We begin planning our conferences 18 months in advance, with a goal of having a signed contract 12 months in advance. If your company is interested in sponsoring a future conference, please notify us at least 18 months in advance if possible, so that we can include your organization in the site selection and the planning of the conference.

Future Conference Sponsors

EVENT	UTILITY	VENDOR
Summer 2025	Southern Nuclear	ASC Engineered Solutions
Summer 2026	TBD	Element Materials Technology
Summer 2027	TBD	Lisega
Summer 2028	TBD	Curtiss-Wright
Summer 2029	TBD	ASC Engineered Solutions
Summer 2030	TBD	Element Materials Technology

Conference Planning Committee Report

SNUG 2024 Presentation
Millstone
Handling of Piping and Pipe
Support Modifications

Ed Dundon

Millstone Units 2 & 3

- Committed to 2012 ASME OM
 - Subsection ISTD - 1600 Snubber Modification and Replacement
 - Replacement – parts, adjustments, and similar actions that do not change the design (configuration and material) of an item. (ISTA -2000 Definitions)
 - Replacement Snubber: any snubber other than the snubber immediately previously installed at a given location in place. (ISTD -2000 Definitions)
 - Modification – alteration in the design of a system, structure or component (ISTA -2000 Definitions) .

Subsection ISTD - 1600 (cont.)

- Snubber replacement activities shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code, as applicable.
 - Section XI repair/replacement plan
 - 'As Left' Section XI visual inspection – VT-3 exam & VT- 3 qualified inspector
 - Replacement Snubber or Modified Snubber(s) will shall have proven suitability for application or environment. (Need to follow licensing Code requirements/Construction requirements)

ISTD - 1620 – Examination & Testing

- Replacement or modified snubbers shall be examined and tested in accordance with written procedures. The applicable requirements of paragraphs ISTD-4100, ISTD-4200, ISTD-5200, and ISTD-5500 shall be included in these procedures. The requirements selected shall ensure that the criteria of paragraphs ISTD-4110, ISTD-4230, and ISTD-5210 can be satisfied.

ISTD - 4110 – Preservice Examination

- The initial examination shall, as a minimum, verify the following:
 - (a) **no visible signs of damage or impaired** operational readiness exist as a result of storage, handling, or installation.
 - (b) the snubber **load rating, location, orientation, position setting, and configuration** (e.g., attachments and extensions) **are in accordance with design drawings and specifications**. Installation records (based on physical examinations) of verification that the snubbers were installed according to the design drawings and specifications shall be acceptable in meeting this requirement.
 - (c) **adequate swing clearance** is provided to allow snubber movement.
 - (d) if applicable, **fluid is at the recommended level,** and **fluid is not leaking** from the snubber system.
 - (e) **structural connections**, such as pins, bearings, studs, fasteners, lock nuts, tabs, wire, and cotter pins, **are installed correctly**.

Nonmandatory Appendix B

Examination Checklist

- Incorrect snubber load rating
- Incorrect installed location
- Incorrect installed orientation (example – vented reservoir does not drain out)
- Incorrect position setting
- Incorrect snubber configuration
- Inadequate swing clearance
- Snubbers with preset locking screws used for shipment are not removed.
- Protective coverings or shipping plugs not removed

ISTD - 4230 – Visual Examination Requirements

- **Restrained Movement-** Snubber is capable of restraining pipe movement as designed.
 - Loose fasteners or member corroded or bent (piston rod)
 - Disconnected components
- **Thermal Movement-** No binding misalignment or deformation is observed.
 - (Hot Check at NOP / NOT)
- **Design-Specific Characteristics**
 - No design specific defects
 - No snubber fluid issues

ISTD - 5210 – Test Parameters

Snubber operational readiness tests shall verify the following:

- Activation is within the specified range of velocity or acceleration in tension and in compression.
- Release rate, when applicable, is within the specified range in tension and in compression. For units specifically required not to displace under continuous load, ability of the snubber to withstand load without displacement.
- Mechanical snubbers, drag force is within specified
- limits, in tension and in compression.

Millstone functionally tests all new snubbers prior to installation independent of vendor test results

Historical Mods and Issues at Millstone

- PORV line rerouted for better sloping & new flanged PORV
 - Changes : thermal movements; snubber loads; snubber travel; snubber sizes and snubber orientation
 - Visuals inspections: Initial “as left” cold; Initial as left hot (NOP/NOT); as found cold for 1st & 2nd refueling after modification (Reference ISTD-4252)
 - Visual inspections thereafter following normal visual inspection for all snubber.
 - Biggest challenge: Management buy- in for the hot visual inspection.

Historical Mods and Issues (cont.)

- Rerouting of Main Steam line to AFW turbine to stop chattering check valve.
 - Changes : thermal movements; snubber loads; snubber travel; snubber sizes and snubber orientation
 - Visuals inspections: Initial “as left” cold; Initial as left hot (NOP/NOT); as found cold for 1st & 2nd refueling after modification (Reference ISTD-4252)
 - Biggest challenge: One snubber did not travel to Hot Piston Setting from Computer Analysis
 - Visual examination of near-by pipe supports found a vertical restraint limit horizontal travel of the pipe run. Management buy- in for the hot visual inspection. Changed rigid support to permit horizontal travel will at NOP/NOT.
 - Still snubber travel was limited. Re-analyzed piping with travel stop. Stresses were within code allows
 - Fall 2024 further investigation for locating the restriction to pipe movement

ISTD - 4252 – Subsequent Examination Internal

- Subsequent examination internals shall begin at the end of the previous examination interval and conclude at the end of the next refueling
- Interval prior to the completion of the of the second refueling shall not exceed one fuel cycle in duration.
- Interval prior to the completion of the of the second refueling shall be in accordance with Table ISTD-4252-1.

Millstone interpretation of ISTD – 4230 & 4252 for visual examination of snubber modifications:

Initial 'as left' Cold visual examination

Initial 'as left' Hot visual examination

1st Refueling post mod 'as found' Cold visual examination

2nd Refueling post mod 'as found' Cold visual examination

Back to normal visual inspection interval for modification snubbers

- Questions?



Snubber Testing During Single Train Outages



We are being challenged by our management.

As sites continue to look for more and more ways to reduce the length of refueling outages, one thing that is being considered is to divide the outage into single train outages so that the impact on the outage critical path will be lessened. Our management is continually challenging us to look at our programs and determine if the codes and standards that guide our programs will allow us to get on board and participate. If we tell them that our guiding codes and standards will not permit us to divide our program into single trains and still meet all the requirements, we will be challenged to poll the industry to see what others are doing and to think outside the box and be innovative, while still meeting the code and standard requirements.

The following slides will give you some things to think about when challenged by your superiors.



Things to consider

- Size of population
 - How many total snubbers are in the population of snubbers to be tested?
- Number of defined test plan groups (DTPGs)
 - How many defined test plan groups (DTPGs) is the population divided into?
- Which test plan is being used?
 - This may be dependent on how many DTPGs you have. If a DTPG contains 370 or more snubbers, you are probably using the 37 plan for that DTPG. If a DTPG has less than 370 snubbers, you are probably using the 10% plan for that DTPG.
- What is the basis of your DTPG makeup?
 - ISTD gives you a lot of flexibility in determining how your population is divided up into DTPGs, but it is not limitless. There are some specific guidelines in the code on DTPG makeup.

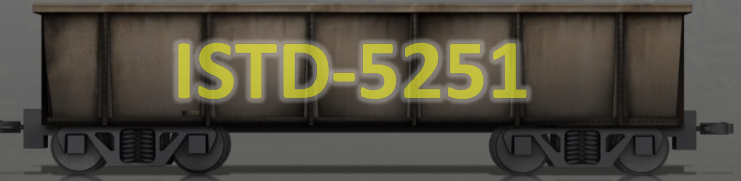
Let's take a closer look

Defined Test Plan Groups

An orange freight car with the text "DTPG" in yellow on its side.

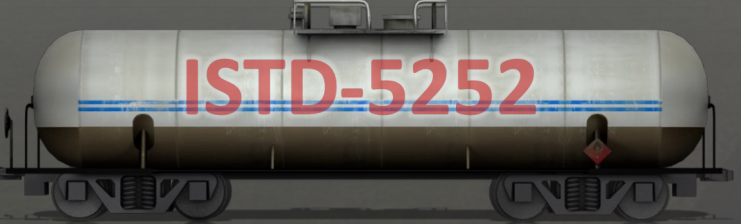
DTPG

defined test plan group (DTPG): a population of snubbers from which samples are selected for testing.

A dark brown freight car with the text "ISTD-5251" in yellow on its side.

ISTD-5251

DTPGs General Requirement. The DTPGs shall include all snubbers except replacement snubbers and snubbers repaired or adjusted as a result of not meeting the examination acceptance requirements of ISTD-4200. These snubbers shall be exempt for the concurrent test interval.

A white cylindrical tank car with blue horizontal stripes and the text "ISTD-5252" in red on its side.

ISTD-5252

DTPG Alternatives. Except as required by ISTD-5253, the total snubber population may be considered one DTPG, or alternatively, differences in design, application, size, or type may be considered in establishing DTPGs. DTPGs shall not be changed after initiating a test campaign.

A blue freight car with the text "ISTD-5253" in white on its side.

ISTD-5253

Additional DTPG Requirements for Pressurized Water Reactors (PWRs). Snubbers attached to the steam generator and snubbers attached to the reactor coolant pump shall be at least one, separate DTPG.

Test Plans



ISTD-5310 The 10% Testing Sample Plan, Sample Size, and Composition

ISTD-5311 Initial Sample Size and Composition. The initial sample shall be 10% of the DTPG, composed according to either (a) or (b).

- (a) As practicable, the sample shall include representation from the DTPG based on the significant features (i.e., the various designs, configurations, operating environments, sizes, and capacities) and based on the ratio of the number of snubbers of each significant feature, to the total number of snubbers in the DTPG. Selection of the representative snubbers shall be random.
- (b) The sample shall be generally representative as specified in (a), but may also be selected from snubbers concurrently scheduled for seal replacement or other similar activity related to service life monitoring. The snubbers shall be tested on a generally rotational basis to coincide with the service life monitoring activity.

Test Plans



ISTD-5410 The 37 Testing Sample Plan, Sample Size, and Composition

ISTD-5411 Initial Sample Size and Composition. An initial sample of 37 snubbers shall be selected randomly from each 37 plan DTPG.

So, given the parameters we have to work within, the question is:

Can it be done?



Possibly, but it would have to be carefully planned out

If you are using the 37 Plan, the ASME OM code does not provide an allowance for excluding snubbers from potential random selection based on train or division. The 37 Plan requires TOTALLY random selection from each DTPG each cycle, and single train testing would essentially be creating a DTPG for each train, and ISTD-5252 tells us that DTPGs can be divided by “design, application, size or type”. There may be room to argue that “application” can include a single train. We are not aware of that argument ever being made, but a site willing make the argument would be breaking new ground.

If you are using the 10% Plan, it might be somewhat easier, but it might also add more snubbers that have to be tested. As discussed above, one possible way to test within a single train is to divide the DTPGs into separate trains by classifying a train as an “application”. However, in doing so, the DTPGs that you originally had defined now change sizes, so 10% of the number of snubbers in two (or more) single trains could be more than if you had maintained the snubbers in one DTPG population.

Other considerations

Limiting testing to a single train could also expose larger vulnerabilities than does random selection from all trains. A big question is a scenario where there is an unacceptable snubber test from a single train on a double train system – where the logical extent of condition question in single train testing would immediately point to the sister snubber on the other train simply due to the initial limitation of the one train sample. In a “normal” 37 Plan sample that is truly random with no train exclusions the randomness of the original sample and the supplemental samples adds a statistical basis to the supplemental testing that is defensible (although one could still argue that the sister snubber should be checked depending on the cause as a FMG, the overall randomness of the initial and supplemental samples meets code basis). In a one train sample where essentially half of the installed snubbers on a system are excluded from consideration the effectiveness of the sampling technique is significantly diluted.

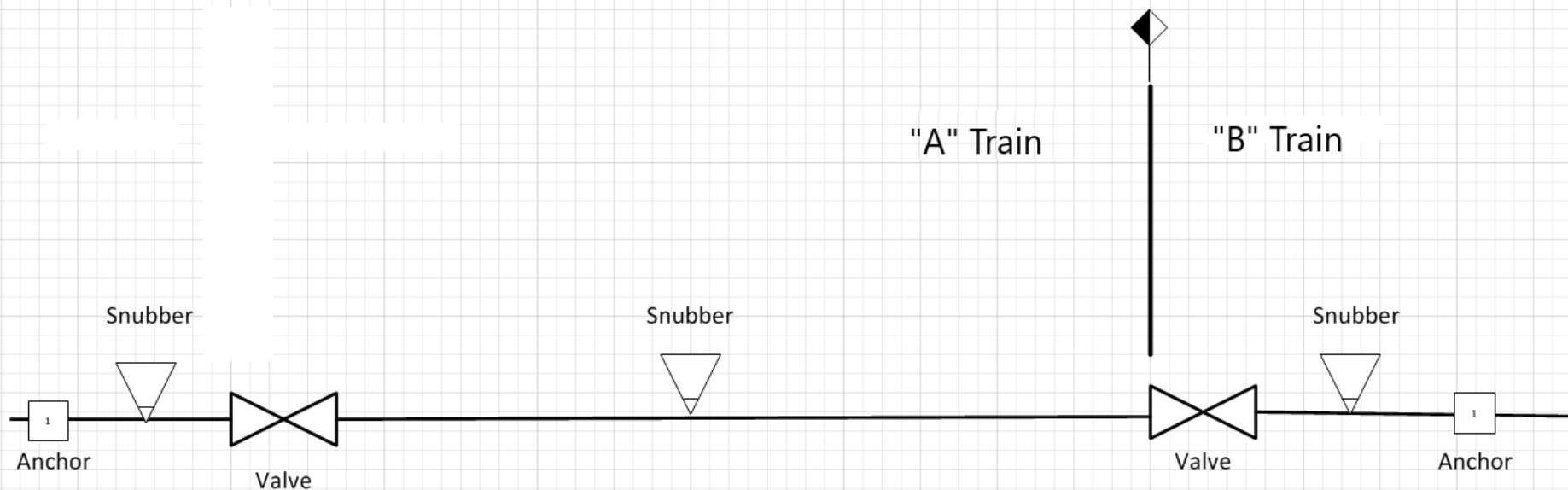
Code Case or Relief Request?

There has been discussion of a code case or relief request to address single train testing, which would include some specific actions to be taken in the opposite train in the event of a failure. But just what those actions would be and how severe they may need to be to satisfy regulators is anyone's guess.

One potential avenue around this would be to utilize OMN-15 to enable skipping an outage – testing every other outage. Then you could define each train as a separate DTPG and test them in alternating outages. Of course, this means meeting the prerequisites first by having a good performance record using “normal” testing, then setting up the Code Case testing for each DTPG. But even then, failures that could affect the other trains or DTPGs may invoke extent of condition actions at any time. You would also not be able to use OMN-13 or code permitted ten-year visual intervals.

One other thing to consider

Trains are typically defined by isolation boundaries such as valves. However, snubbers work within stress problems, which are defined by anchors. So there may be a case where removal of a snubber in one valve defined train may affect the operability of a portion of a different train because of a stress problem boundary that crosses both trains.

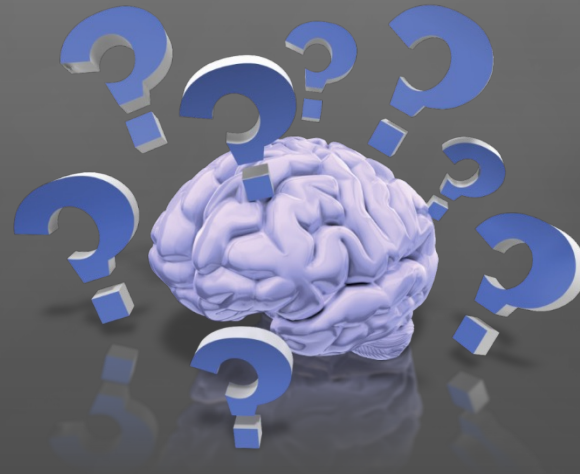




Hopefully, this has answered more questions for you than it has created



Questions?



QUESTION CARDS

?



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