NAV03 VT - NONDESTRUCTIVE TESTING (ISO 4.9)

Vendor: _____ **Auditor:** _____ **Date:** _____

1.	Routine Scheduled Audit a. Annual ☐ b. Semi-annual ☐ c. Other ☐
2.	Product driven Audit a. Product received by the Prime Vendor that does not meet specification requirements. ☐ b. Product that was installed or was being installed the does not meet specification requirements. ☐ c. Product has failed in service and investigations show it did not meet specification requirements. ☐

What specification is the Audit being performed to?

3.	Governing Specification: Mark the appropriate specification a. MIL-STD-2132 ☐ b. NAVSEA 250-1500-01 (Welds) ☐ c. MIL-STD-271 (F) ☐ d. T9074-AS-GIB-010/271 ACN1 ☐ e. T9074-AS-GIB-010/271 Revision 1 ☐ f. Other _____ ☐
4.	Program Type: Mark the appropriate program type a. Level I / SubSafe ☐ b. Nuclear Plant Material ☐ c. Fly by Wire Ships Control System ☐ d. Navy Propulsion Program ☐ e. Naval Nuclear Propulsion Program ☐ f. Deep Submergence Systems / Scope of Certification Program ☐ g. Aircraft Launch and Recovery ☐ h. Other _____ ☐
5.	Does the vendor have an NDT Examiner? a. In house ☐ b. Contracted ☐ c. Certified in the method ☐ d. Available for the Audit ☐ e. No Examiner ☐
6.	Is the NDT inspection program administration code or specification complaint? a. Level III Approved written practice ☐ b. Approved procedures i. Level III ☐ ii. Prime contractor ☐ iii. Clearly specifies inspection requirements ☐ iv. Clearly specifies acceptance criteria ☐ v. Qualified to find known defects ☐

	c. Approved technique sheet	
	i. Level III	☐
	ii. Prime contractor	☐
	iii. Clearly specifies inspection requirements	☐
	iv. Clearly specifies acceptance criteria	☐
	d. Approved technical work documents	
	i. Level III	☐
	ii. Prime contractor	☐
	iii. Clearly specifies inspection requirements	☐
	iv. Clearly specifies acceptance criteria	☐
	e. Inspector records	
	i. Is there a current eye examination	☐
	ii. Certifications are current	☐
	iii. Previous certifications included	☐
	iv. Educational history	☐
	f. Workmanship standards	
	i. Available	☐
	ii. Controlled	☐
7.	Are material controls in place?	
	a. Segregated (Level I, Subsafe, etc.)	☐
	b. Controlled	☐
	c. Traceable	☐
	d. Procedure for disposition	☐
8.	Are records maintained to confirm that all required inspection processes were performed?	
	a. Description and unique identification of item being inspected	☐
	b. Approved procedure identification	☐
	c. Acceptance standard used	☐
	d. Date of inspection	☐
	e. Signatures of inspectors	☐
	f. Disposition (accept / reject) of the item inspected	☐
	g. Retention (Where and how long)	☐
9.	1. Technical Concerns: List the technical concerns associated with the method.	
	a. <u>Pre-Weld Fit-up and Dimensional</u>: Pre-weld dimensions and fit-up attributes should be verified when applicable.	
	b. <u>Weld Contour (as welded or ground)</u>: An improper weld contour can have a detrimental effect on the integrity of the weld joint and higher level NDT methods such as MT, PT, UT and RT.	
	c. <u>Weld size (minimum and maximum)</u>: Specified weld sizes are based upon engineering, design and service requirements. Weld size verification is an important attribute to ensure the engineered strength weld and component can meet its intended purpose.	
	d. <u>Acceptance Criteria</u>: Acceptance criteria can vary depending on joint design, weld classification and higher level NDT requirements (PT, MT, UT, RT). Inspection procedure and Acceptance criteria should be available to inspector at workstation	
	e. <u>Inadequate Process Controls</u>: Thorough and technically comprehensive VT procedures ensure the inspector has adequate and detailed direction to evaluate any weld or applicable surface.	

	f. <u>Inadequate Technique</u>: Inspector technique and methodology when performing visual weld inspection, especially measuring and dimensional verification of weld size and discontinuity size, are critical. Proper use of lighting is an important and helpful component of the inspection to enhance identification of surface discontinuities. Shadow formation caused by ridges and crevices are more readily visible and identifiable with proper flashlight angulation.
10.	Known Process Problems: List the known process problems a. Required inspection tools available b. Inspection tools calibrated (when required) c. Is the lighting adequate (is there a procedure requirement?)

Checklist Instructions: Be specific and ask follow-up questions as appropriate.
  a. Any condition that is considered to be non-compliant must be specifically documented as to what the deficiency is.
    i. Specification
    ii. Page
    iii. Paragraph
    iv. Detailed description of what was observed

  b. Document comments or observations on the checklist at each checkpoint or the comment section, as needed, no matter if the checkpoint is satisfactory or unsatisfactory.

  c. Comments on any checkpoint may be positive, as well as negative.

  d. If it is observed that an attribute requires additional attention but does not invalidate the inspection, mark the Needs Improvement (NI) column and provide a recommendation in the comments area.

<u>**Review all findings with the vendor to be sure there is no confusion as to what the findings are before you leave the vendor site.**</u>

Inspector Name: _____

Procedure: _____ VPAR Approval: _____

Part examined: _____

1.	*Did the Examiner/Supervisor conduct a pre-work brief?*	Sat ☐ Unsat ☐ NI ☐ N/A ☐
2.	Was the component or joint being inspected clearly identified?	Sat ☐ Unsat ☐ NI ☐ N/A ☐

3.	Was the inspection zone adequate (HAZ, 1/2" or 1" on either side of the weld, etc.)?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
4.	Is the lighting correct for the inspection?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
5.	Was the supplemental lighting manipulated as needed?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
6.	Were the tools in good condition?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
7.	Were the tools calibrated? (Mil-I-45208 3.3, ISO 9001 7.1.5)	Sat ☐ Unsat ☐ NI ☐ N/A ☐
8.	Were the correct tools used for the inspection?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
9.	Was the inspectors' eye at the correct distance and angle for the job?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
10.	Was the 5X magnification technique properly applied, when required?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
11.	For Class P-1 pipe socket welds, is the required scribe line present?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
12.	Were the pre-weld fit-up dimensions (end prep) within parameters for the applicable joint design?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
13.	Was there a proper evaluation of the part, including ID of pipe where applicable?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
14.	VT inspection required at the time of maximum accessibility for ID VT (before other welds were added that render the weld ID inaccessible for VT?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
15.	For pipe welds that are partially inaccessible for V T of the ID, is VT applied for defects that can be checked with extended mirrors and or flashlights, such as burn through, lack of penetration, and rejectable oxidation?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
16.	Do two-sided groove welds receive VT, or required inspection by production personnel, of back-gouged surfaces to the required acceptance criteria?	Sat ☐ Unsat ☐ NI ☐ N/A ☐

17.	Are one-sided butt/groove welds without backing or consumable inserts free of lack of penetration on the ID?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
18.	For VT inspectors of pipe welds, does the surveillance/TPE performed by the Level III Examiner cover the inspection of weld IDs?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
19.	For castings, did the inspector correctly evaluate for all applicable acceptance criteria of the fabrication document or other applicable specifications?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
20.	For pressure containing welds, if discernable, is there evidence of at least two layers of weld material?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
21.	Was the reinforcement height / fillet size properly measured (once per weld or every 3 feet, highest / lowest area)?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
22.	For other than P-1 socket welds if the fitting edge is largely melted away, is there a scribe line to permit measurement of minimum fillet leg length on the pipe?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
23.	Is the weld free of sharp irregularities and rollover and are all angles on the weld surface and toes of the weld at least 90 degrees or greater?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
24.	Does the weld meet the required weld size (fillet, butt, pipe, structural, etc.)? List the class required and weld size.	Sat ☐ Unsat ☐ NI ☐ N/A ☐
25.	Is the weld free of cracks, burn through and incomplete fusion?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
26.	Is joint offset present and does it exceed the maximum limit? List the maximum allowed.	Sat ☐ Unsat ☐ NI ☐ N/A ☐
27.	Does the weld contain melt through? If it does, does it contain cracks, crevices, excessive oxidation or globules?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
28.	Does the weld contain convexity or concavity and does it exceed the maximum allowed? For one-sided pipe or other full penetration butt/groove welds without backing rings, is ID concavity/convexity correct? List the maximum allowed depth or height.	Sat ☐ Unsat ☐ NI ☐ N/A ☐
29.	Does the weld contain crater pits? If it does, does it contain cracks and does convexity, concavity and weld thickness meet requirements? List maximum allowed depth or height.	Sat ☐ Unsat ☐ NI ☐ N/A ☐

30.	Was the reinforcement height / fillet size properly measured (once per weld or every 3 feet, highest / lowest area)?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
31.	Does the weld contain oxidation, (oxide scale accompanied by a wrinkled or crystalline surface appearance)? Tightly adhering, iridescent temper films are acceptable.	Sat ☐ Unsat ☐ NI ☐ N/A ☐
32.	Does the weld contain porosity and does it exceed the maximum size and summation? List the maximum size and summation allowed.	Sat ☐ Unsat ☐ NI ☐ N/A ☐
33.	Does the weld and adjacent base metal contain arc strikes? Does the removal site cavity exceed the maximum depth allowed? Where required, was etching used to verify the removal of the HAZ? List the class and maximum depth allowed.	Sat ☐ Unsat ☐ NI ☐ N/A ☐
34.	Does the weld and adjacent base metal contain gouges, grind marks or surface roughness? Are they rounded and free of notches and do they exceed the maximum depth allowed? List class and maximum depth.	Sat ☐ Unsat ☐ NI ☐ N/A ☐
35.	Does the weld contain weld spatter and does it exceed the maximum size allowed? List class and maximum size allowed.	Sat ☐ Unsat ☐ NI ☐ N/A ☐
36.	Does the weld contain slag and does it exceed the maximum size allowed? List class and maximum size allowed.	Sat ☐ Unsat ☐ NI ☐ N/A ☐
37.	Is there undercut present and does it exceed the depth allowed? List class and maximum depth allowed.	Sat ☐ Unsat ☐ NI ☐ N/A ☐
38.	Does the weld contain end-melt (Tee welds only) and does it exceed the maximum depth allowed? List the class and maximum depth allowed.	Sat ☐ Unsat ☐ NI ☐ N/A ☐
39.	Were all discontinuities properly identified?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
40.	Were the discontinuities properly sized or dimensioned?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
41.	Did the inspector demonstrate knowledge of the correct acceptance criteria and how the acceptance criterion is determined?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
42.	Was the sample evaluated for all the conditions required by the procedure?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
43.	Was a report filled out correctly and with all the information required by the procedure with the proper disposition of any discontinuities? (TP-271 8.4, 250-1500-1 8.2)	Sat ☐ Unsat ☐ NI ☐ N/A ☐

43a.	If welds are covered by TP 278 para 4.1.3, were results recorded on the required record?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
44.	Is vision correction required? (Verify) Was vision correction worn during inspection? (TP-271 1.6.6.2, 250-1500-1 6.7.5)	Sat ☐ Unsat ☐ NI ☐ N/A ☐
45.	Did the examiner that was watching the TPE provide feedback (either positive or negative) to the inspector after the examination was completed?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
46.	Is there a corrective action system or remedial training plan in place for when inspector errors occur and is there evidence that it is followed?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
	Titanium Inspection:	
47.	Is the VT Inspector trained and certified to inspect titanium?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
48.	Is the VT Examiner trained and certified to inspect titanium?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
49.	Does the VT procedure cover titanium color inspection?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
50.	If required, can the inspector distinguish the colors used in the method during inspection? (Colorblind)	Sat ☐ Unsat ☐ NI ☐ N/A ☐
51.	Do the color workmanship standards represent all colors and conditions?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
52.	Are the color workmanship standards available to the inspector?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
53.	Was the backside of the weld, regardless of thickness and joint type, shielded? If not was the temperature measured and below 500 F?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
54.	Is each pass inspected for color?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
55.	Who performs the inter-pass color inspection?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
56.	If the color was rejectable on the inter-pass bead, was the cause determined and corrective actions taken before welding resumed?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
57.	If the color was rejected for other than straw, was the weld bead removed for the minimum required depth?	Sat ☐ Unsat ☐ NI ☐ N/A ☐

58.	Is there evidence of brushing, sanding, or grinding on the weld surface at the time of color inspection?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
59.	Is the backside of two-sided welds inspected for color in the as deposited condition? (Before sanding, grinding, etc.)	Sat ☐ Unsat ☐ NI ☐ N/A ☐
60.	Is the I/D accessible for color inspection? If not was the dew point validated for exit purge gas for the specific weld involved? Confirmed by inspector?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
61.	Was the color and boundary of weld + 1/32" correctly identified?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
62.	Was the luster acceptable?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
63.	Was the color of the HAZ (> 1/32" from toe) correctly identified?	Sat ☐ Unsat ☐ NI ☐ N/A ☐
64.	For welds not covered by TP-278 Paragraph 4.1.3, did the VT inspector record/certify acceptable color and specifically list the governing acceptance criteria?	Sat ☐ Unsat ☐ NI ☐ N/A ☐

Concerns/Comments