


INCOMING INSPECTION REPORT

Customer	Nghi Son Refinery & Petrochemical LLC	UNEW Work Order No.	825089
Customer P.O. No.	1003946086	Report Date	April 30, 2026
Engine Type	MS6001FA (GE Frame 6FA)	Component	MS6001FA Transition Piece
Component Part No.	119E9674G002	Qty. Received	6 Units (1 Complete Set)
Material	Nimonic263 (Body, Picture Frame, Inlet Bore) Hastelloy-X (Forward Support Ring) FSX-414 (Lug / H-Block) SS304 (Impingement Sleeve, Bracket, Strip, Impingement Belt) L605 (Floating Seals — Inner, Outer)	As-Received Coating	TBC Coating — Inside Body & Inside Picture Frame Chrome Carbide Coating (Forward Support Ring) No Coating (Inlet Bore, H-Block)
Repair Classification	Standard (Standard (Mechanical))	Coating Requirement	Chrome Carbide Coating (Inlet End & Support Ring) MCrAlY / TBC Internal Body
Total Initiated Starts	476	Total Emergency Trips	125

Responsible Product Engineer: 


Mr. Chaowarit Junjorhor

Sr. Engineer

Report prepared by: 

Ms. Nalinee Supapradit

Report writer



Report reviewed and approved by: Mr. Pheerayawat Muadna
(Engineering Manager)

1. INTRODUCTION:

Six (6) MS6001FA Transition Pieces have been received from Nghi Son Refinery and Petrochemical LLC and subjected to a comprehensive incoming inspection process. This process included receipt inspection, serial number verification, dimensional inspection, pre-strip ultrasonic wall thickness measurement, coating removal, incoming solution heat treatment, visual inspection, fluorescent penetrant inspection (FPI), post-strip ultrasonic inspection, and metallurgical evaluation of the base material. The initial findings and results of the incoming inspection are presented as follows.

Order Information		
UNEW Work Order no.	825089	
Date of report	April 30, 2026	
Customer P.O. no.	1003946086	
Component Details		
Engine type	MS6001FA	
Component type	Transition piece	
Component part number	119E9674G002	
Qty. received	6	
Material type	Body	Nimonic263
	Picture frame	Nimonic263
	Inlet bore	Nimonic263
	Forward support ring	Hastelloy-X
	Lug (H-block)	FSX-414
	Impingement sleeve	SS304
	Bracket	SS304/Inconel 718/SS310
	Strip	SS304
	Impingement belt	SS304
	Floating seals-inner, outer	L605
As received coating type (s)	Body	TBC coating on inside body
	Picture frame	TBC coating on inside body
	Inlet bore	No
	Forward support ring	Chrome carbide coating
	H-block	No
As received wear strip applied (s)	Picture frame-Inner/outer/side	
Additional items received with main set (if any)	-	
Customer supplied component history		
Total Initiated Starts	476	
Manually Initiated Starts	468	
Fired Starts	180	
Total Emergency Trips	125	
Breaker Tripped At Load Count	127	
Operational fuel type	(No information supplied)	
Mode of operation (base load / peaking)	(No information supplied)	
Maintenance Intervals Combustion	(No information supplied)	
Maintenance Intervals Hot gas path	(No information supplied)	

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2. EXECUTIVE SUMMARY:

Six (6) MS6001FA transition pieces received from Nghi Son Refinery and Petrochemical LLC were inspected upon receipt. Following cleaning, coating removal, incoming solution heat treatment, visual inspection, fluorescent penetrant inspection (FPI), ultrasonic wall thickness measurement, and dimensional inspection, UNEW Engineering has classified all six units as Standard (Medium) REPAIR. No components are recommended for scrap.

The primary damage identified across the set includes fretting wear at the inlet bore, picture frame wear strips, and H-blocks, along with deformation and wear on the inner and outer floating seals. Surface-level cracking was confirmed on the outer picture frame wear strips of units 1, 3, 4, and 5 and on the inner picture frame wear strip of unit 6. The transition piece bodies show no structural cracking. Weld and blend repair is required at all affected wear strip and impingement sleeve locations. Dimensional inspection confirmed that exit end and picture frame slot dimensions are outside acceptable limits on all six units, requiring cold press correction to reinstate blueprint geometry.

The metallurgical evaluation confirmed the body material as Nimonic263 with a stable microstructure and full suitability for weld repair. The operational history of 476 Total Initiated Starts and 125 Total Emergency Trips is consistent with the level of wear and fretting observed and supports the Standard (Medium) Repair classification.

All repair operations will be performed in accordance with UNEW approved repair procedures and quality standards, followed by Chrome Carbide coating to the inlet end and forward support ring, and MCrAlY bond coat with TBC topcoat to the internal body surface.

3. INSPECTION SUMMARY:

Based on the findings of the incoming inspection process, the following recommendations are submitted by UNEW Engineering for the required repair category, required coatings, and replacement materials necessary to restore the components to a serviceable condition.

3.1 OPERATIONAL HISTORY:

The following operational history was supplied by the customer and is considered in the assessment of damage severity and repair classification:

- Total Initiated Starts: 476 | Manually Initiated Starts: 468 | Fired Starts: 180
- Total Emergency Trips: 125 — a notably high count consistent with repeated thermal shock events that accelerate fretting damage and wear at all contact interfaces across the transition piece body, picture frame, and impingement sleeve locations.
- Breaker Trips at Load: 127 — consistent with cyclic thermal loading contributing to progressive fretting and surface cracking at the picture frame wear strip locations.

The operational history is consistent with the level of wear, fretting, and surface cracking observed across the complete set and supports the Standard (Medium) Repair classification.

3.2 DAMAGE SUMMARY:

The following damage categories were identified across all six (6) transition pieces:

Damage Category	Finding (As Inspected)	Disposition
Frettage at Inlet Bore	Light frettage confirmed on all inlet bores across all 6 units. Inlet bore ID and roundness recorded as REJECT on units 1, 4, and 6.	Blend Repair
Wear and Cracking at Impingement Sleeve	Light to Standard (Medium) frettage confirmed across all 12 impingement sleeves. Cracks of 2 to 5 mm confirmed across the set. Weld and blend repair required to restore sleeve profile.	Weld and Blend
Frettage and Cracking at Inner Picture Frame Wear Strip	Standard (Medium) frettage confirmed on all inner picture frame wear strips across all 6 units. A 10 mm crack confirmed on unit 6. All inner wear strips require replacement.	Replace / Weld and Blend
Cracking at Outer Picture Frame Wear Strip	Cracks of 5 to 10 mm confirmed on outer picture frame wear strips of units 1, 3, 4, and 5. Weld and blend repair required at all affected locations.	Weld and Blend
Frettage at Side Picture Frame Wear Strip	Light to Standard (Medium) frettage confirmed on all side picture frame wear strips (2 per unit) across all 6 units. All side wear strips require replacement.	Replace
Frettage and Wear at H-Blocks	Light frettage confirmed on all H-blocks (2 per unit) across all 6 units. H-block dimensions remain within acceptable limits. Blend repair sufficient to restore contact surfaces.	Blend Repair
Deformation and Wear at Inner Floating Seals	Deformation and wear confirmed on all inner floating seals across all 6 units. All inner floating seals require replacement.	Replace
Deformation and Wear at Outer Floating Seals	Deformation and wear confirmed on all outer floating seals across all 6 units. All outer floating seals require replacement.	Replace
Exit End Dimensional Deviation	Exit end dimensions recorded as REJECT on all 6 units. Cold press correction required to reinstate blueprint geometry prior to coating.	Cold Press and Reshape
Picture Frame Slot Dimensional Deviation	Picture frame slot dimensions recorded as REJECT on all 6 units. Dimensional restoration required across the complete set.	Dimensional Restoration

3.3 DIMENSIONAL INSPECTION SUMMARY:

Key dimensional findings from the incoming inspection are summarised below:

Inspection Parameter	Result	Status
Inlet Bore ID	Out of limit on units 1, 4, and 6. Within acceptable limits on units 2, 3, and 5.	REJECT — 3/6
Inlet Bore Roundness	Out of limit on units 1, 4, and 6. Within acceptable limits on units 2, 3, and 5.	REJECT — 3/6
Exit End	All 6 units recorded as REJECT. Cold press correction required to reinstate geometry.	REJECT — 6/6
Wall Thickness	Wall thickness within acceptable limits across all 6 units.	ACCEPTABLE
H-Block Dimension	H-block dimensions within acceptable limits across all 6 units.	ACCEPTABLE
Size of PF Slot	Picture frame slot dimensions recorded as REJECT on all 6 units. Dimensional restoration required.	REJECT — 6/6

3.4 BODY AND STRUCTURAL CONDITION:

Visual inspection and fluorescent penetrant inspection confirmed that the transition piece bodies show no structural cracking, heavy corrosion, or base metal loss across all six units. The internal and external body surfaces exhibit normal oxidation consistent with the operational history, which will be removed by blending during repair. Wall thickness measurements are within acceptable limits across the complete set, confirming that no weld build-up to the main body is required. The base material was confirmed as Nimonic263 by metallurgical evaluation, with a stable microstructure suitable for weld repair and heat treatment.

3.5 REPAIR CLASSIFICATION:

The combined findings of surface-level cracking confined to the picture frame wear strips and impingement sleeves, fretage at all contact interfaces, floating seal deformation and wear, and dimensional deviations at the exit end and picture frame slots confirm that this set requires Standard (Medium) REPAIR. The transition piece bodies remain structurally sound with no evidence of deep cracking, heavy internal corrosion, or base metal loss. All six units are within the Standard (Medium) Repair limits established by UNEW Engineering and will be restored to a serviceable condition in accordance with the approved Standard (Medium) Repair work scope.

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4. ENGINEERING EVALUATION AND RECOMMENDATION:

Following receipt, cleaning, coating removal, incoming solution heat treatment, visual inspection, fluorescent penetrant inspection (FPI), wall thickness measurement, dimensional inspection, and metallurgical evaluation, UNEW Engineering has assessed all six (6) MS6001FA transition pieces (UNEW Work Order 825089) received from Nghi Son Refinery and Petrochemical LLC.

The damage identified across the complete set — including frettage at all contact interfaces, surface-level cracking at the picture frame wear strips and impingement sleeves, floating seal deformation and wear, and dimensional deviations at the exit end and picture frame slots — is consistent with normal high-temperature cyclic operation and is within the Standard (Medium) Repair limits established by UNEW Engineering. The transition piece bodies show no structural cracking, heavy internal corrosion, or base metal loss. All six units are confirmed as Standard (Medium) REPAIR. No unit in the set requires heavy repair intervention, and no components are recommended for scrap.

The following operational factors were noted as contributors to the damage observed:

- 476 Total Initiated Starts with 125 Emergency Trips — consistent with cyclic thermal loading contributing to progressive frettage and wear at all contact interfaces, and surface-level cracking at the picture frame wear strip locations.
- 127 Breaker Trips at Load — consistent with repeated thermal shock events accelerating frettage damage at the inlet bore, H-blocks, and impingement sleeve contact areas.
- No fuel type, mode of operation, or maintenance interval data was supplied by the customer. Assessment has been performed based on physical inspection findings and the operational history provided.

4.1 DEFECT FINDINGS AND RECOMMENDED REPAIR ACTIONS:

The table below defines the required repair action for each defect category identified during incoming inspection. All repair methods shall be performed in accordance with UNEW approved repair procedures.

No.	Defect / Condition	Location / Affected Items	Repair Method	Action
1	Frettage at inlet bore	Light frettage confirmed on all 6 inlet bores. Inlet bore ID and roundness REJECT on units 1, 4, and 6.	Blend Repair	REQUIRED
2	Wear and cracking at impingement sleeve	Light to Standard (Medium) frettage cracks of 2 to 5 mm confirmed across all 12 impingement sleeves on all 6 units.	Weld and Blend	REQUIRED
3	Cracking at inner picture frame wear strip	10 mm crack confirmed on inner picture frame wear strip of unit 6. Standard (Medium) frettage on all 6 all inner wear strips to be replaced.	Replace / Weld and Blend	REQUIRED

4	Cracking at outer picture frame wear strip	Cracks of 5 to 10 mm confirmed on outer picture frame wear strips of units 1, 3, 4, and 5.	Weld and Blend	REQUIRED
5	Fretage at side picture frame wear strip	Light to Standard (Medium) fretage confirmed on all side picture frame wear strips (2 per unit) across all 6 units. All to be replaced.	Replace	REQUIRED
6	Fretage and wear at H-blocks	Light fretage confirmed on all H-blocks (2 per unit) across all 6 units. H-block dimensions within acceptable limits.	Blend Repair	REQUIRED
7	Deformation and wear at inner floating seals	Deformation and wear confirmed on all inner floating seals across all 6 units. All to be replaced.	Replace	REQUIRED
8	Deformation and wear at outer floating seals	Deformation and wear confirmed on all outer floating seals across all 6 units. All to be replaced.	Replace	REQUIRED
9	Exit end dimensional deviation	Exit end dimensions recorded as REJECT on all 6 units. Cold press correction required to reinstate blueprint geometry.	Cold Press and Reshape	REQUIRED
10	Picture frame slot dimensional deviation	Picture frame slot dimensions recorded as REJECT on all 6 units. Dimensional restoration required across the complete set.	Dimensional Restoration	REQUIRED
11	TBC coating degradation — internal body and picture frame	Internal TBC coating on body and picture frame requires full removal and reapplication on all 6 units.	Full Strip and Recoat	REQUIRED

NOTE: All weld repairs will be performed using approved filler materials compatible with Nimonic263 base alloy. Pre-weld and post-weld fluorescent penetrant inspection (FPI) is mandatory for all weld repaired areas. Full post-weld heat treatment will be applied after all welding operations are complete to restore material properties and relieve residual stresses.

4.2 RECOMMENDED REPAIR SEQUENCE:

All components shall be repaired in the following sequence to ensure structural integrity, correct geometry, and coating adhesion:

Step	Process	Applies To
1	Receipt inspection, serial number recording and verification on TP body and jacket assembly.	All 6 Units
2	Metallurgical evaluation of base material and coating type, report on condition.	All 6 Units
3	Dimensional inspection and pre-strip wall thickness inspection.	All 6 Units
4	Disassemble aft bracket from TP body. Bag and tag hardware for re-use.	All 6 Units
5	Disassemble TP outer jacket. Ensure serial number of TP body is etched onto jacket skins.	All 6 Units
6	Perform pre-strip ultrasonic inspection.	All 6 Units
7	Mask internal cooling passages and abrasive blast to remove TBC coating.	All 6 Units
8	Perform incoming solution heat treatment in partial pressure vacuum environment.	All 6 Units
9	Degrease components. Grit blast to remove residual coating.	All 6 Units
10	Perform visual inspection and fluorescent penetrant inspection (FPI). Record all defects.	All 6 Units
11	Perform post-strip ultrasonic inspection.	All 6 Units
12	Compile incoming inspection report and forward to customer for discussion and approval.	All 6 Units
13	Blend to remove oxidation product from transition piece body.	All 6 Units
14	Scallop all defective areas in preparation for weld repair.	All 6 Units
15	Cold straighten transition piece main body to reinstate blueprint dimensions.	All 6 Units
16	Perform local fluorescent penetrant inspection of prepared areas.	All 6 Units
17	Degrease and prepare all areas for weld repair.	All 6 Units
18	Perform GTAW weld repairs to all cracked and defective areas.	All 6 Units
19	EDM to recreate the seal slot (Thailand only).	All 6 Units

20	Repair by welding and blending H-blocks to restore dimensional acceptance.	All 6 Units
21	Blend all repaired areas to restore component profile.	All 6 Units
22	Perform post-repair heat treatment to restore material properties.	All 6 Units
23	Assemble matched aft bracket to TP body.	All 6 Units
24	Perform final age heat treatment.	All 6 Units
25	Set in fixture and perform dimensional inspection.	All 6 Units
26	Weld in place new extender wear strips.	All 6 Units
27	Perform local NDT inspection at wear strip locations.	All 6 Units
28	Apply Chrome Carbide hard face coating by APS process to inlet end.	All 6 Units
29	Apply Chrome Carbide hard face coating by APS process to forward support ring.	All 6 Units
30	Set up and reassemble matched TP jackets. Assemble new U frames.	All 6 Units
31	Perform fluorescent penetrant inspection.	All 6 Units
32	Apply MCrAlY bond coat and TBC topcoat by APS process to internal body surface.	All 6 Units
33	Perform visual inspection.	All 6 Units
34	Perform final dimensional inspection and final visual inspection.	All 6 Units
35	Compile Final Report, pack and ship components with all required documentation as listed in Purchase Order.	All 6 Units

4.3 COATING RECOMMENDATION:

The following coating scope applies to the complete set of six (6) MS6001FA transition pieces:

Coating Process	Surface / Area	Applies To
Abrasive blast to remove existing TBC and MCrAlY coating.	All internal gas path surfaces.	All 6 Units
Abrasive blast internal surface. Blow out with clean dry compressed air to remove residual media.	Internal gas path surface.	All 6 Units
Apply Chrome Carbide hard face coating by APS process.	Inlet end.	All 6 Units
Apply Chrome Carbide hard face coating by APS process.	Forward support ring.	All 6 Units
Apply MCrAlY bond coat by APS process.	Internal gas path surface — body and picture frame.	All 6 Units
Apply Thermal Barrier Coating (TBC) by APS process.	Internal body surface.	All 6 Units
Demask, dress and perform visual inspection.	All coated surfaces.	All 6 Units
Perform final dimensional inspection and final visual inspection.	All surfaces.	All 6 Units

4.4 ENGINEERING RECOMMENDATION CONCLUSION:

CLASSIFICATION: Standard (Medium) REPAIR, All 6 MS6001FA Transition Pieces — Order 825089

UNEW Engineering confirms that the complete set of six (6) MS6001FA transition pieces (UNEW Work Order 825089) is classified as Standard (Medium) REPAIR based on the findings of the incoming inspection. The damage identified — fretting at all contact interfaces, surface-level cracking confined to the picture frame wear strips and impingement sleeves, floating seal deformation and wear, and dimensional deviations at the exit end and picture frame slots — is consistent with normal high-temperature cyclic operation and does not indicate deep structural damage, heavy internal corrosion, or base metal loss in the transition piece body.

All six units are within the repairable limits established by UNEW Engineering and will be restored to a serviceable condition in accordance with the Standard (Medium) Repair work scope defined in this report. All repair methods, heat treatment programs, weld procedures, and coating processes will be performed in accordance with UNEW approved process specifications and quality procedures.

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5. SPARE PART (Repair / Replace):

Item	Part description	Received/ Required	Condition	Quantity	Remark
1	Inner floating seal (Cloth seal)	6/6	Replace	6	Additional
2	Outer floating seal (Cloth seal)	6/6	Replace	6	Additional
3	Side wear resistant strip	12/12	Replace	12	Additional
4	Inner wear resistant strip	6/6	Replace	6	Additional
5	Outer wear resistant strip	6/6	Repair	6	-
6	H-Block	12/12	Repair	12	-
7	Nut (Support bracket)	12/12	Replace	12	Standard
8	Aft Bracket Hardware (Bolt)	12/12	Replace	12	Additional
9	Washer (Support bracket)	24/24	Re-use	24	-
10	Guide bush (Support bracket)	12/12	Re-use	12	-
11	Bushing (Support bracket)	12/12	Re-use	12	-
12	Support bracket	6/6	Repair	6	-
13	Nut (Inner picture frame support plate)	6/6	Replace	6	Standard
14	Bolt (Inner picture frame support plate)	6/6	Replace	6	Additional
15	Washer (Inner picture frame support plate)	6/6	Re-use	6	-
16	Inner picture frame support plate	6/6	Repair	6	-
17	Impingement sleeve (half sleeve)	12/12	Repair	12	-
18	Gusset-inner	6/6	Replace	6	Additional
19	Gusset-outer	6/6	Replace	6	Additional
20	Sealing strip-inner	6/6	Replace	6	Standard
21	Sealing strip-outer	6/6	Replace	6	Standard
22	Impingement belt-inner	6/6	Replace	6	Additional
23	Impingement belt-outer	6/6	Replace	6	Additional

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MS6001FA TRANSITION PIECE

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6. PACKING LIST FROM CUSTOMER:

NGHI SON REFINERY AND PETROCHEMICAL LLC (NSRP)
 Nghi Son Economic Zone, Hai Binh Ward, Thanh Hoa Province, Viet Nam

PACKING LIST

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Ship to: Address:	ETHOSENERGY (THAILAND) 39-9 Semsuwan Road, Tambon Maptaphut Amphur Muang, Rayong, 21150, THAILAND PK: Mr. Chamut Chaupwan Office: (+66) 02 017 0477 Mobile: (+66) 084 813 9039 chamut.chaupwan@ethosenergy.com	PL number: VI/2026.02-UNEW Date: 3 Mar 2026 Contract: 128/2024-NSRP-Maint-UNEW Origin: USA Terms: FOB INCOTERMS 2010
Bill to:	UNEW Inc. 3321 SE Gran Park Way Stuart, Florida USA 34997 Attn: Jessica Porter Phone: +1-772-408-4600	

Description	MAXIMO	P/N	S/N	UOM	Box	Dim (CM)	Gross Weight	Net Weight
CAP AND LINER ASSY	2060129700	119E9620G001	11151561	PC	1/B	H185 X W115 X L181	310	180
			11160962					
			11151560					
			11160961					
			11151558					
			11151559					
BFA+E TRANSITION PC ASSY	2060129787	119E9674G002	213988-773	PC	2/B	H100 X W100 X L138	285	192
			213988-775		3/B	H100 X W100 X L138	285	192
			213988-774					
			213988-778					
			213988-777					
			213988-776		4/B	H100 X W100 X L138	285	192
BUCKET KIT, STG 1, BFA	2060119749	105T4888P0016XRV3 105T4888P0015XRV3	As attached file	SET	5/B	H83 X W98 X L111	355	230
NOZZLE KIT, TURB-STG1	2060157737	143E571 LG02 129E9734 P002	SNEC842589	SET	6/B	H84 X L220 X W128	700	575
SHROUD ARR, STG 1 BFA+E	2060119751	119E4234G001	As attached file	SET	7/B	H35 X W62 X L115	255	200
					8/B	H35 X W62 X L115	155	100
							2,630.00	1,867.00

Total packages: 08 packages
Total gross weight: 2630.00 kg

I hereby certify that this is true and correct.
NSRP LLC

Ms. Cu Thi Mai

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7. COMPONENT SERIAL NUMBER CORRELATION:

CORRELATION SHEET			
Item	Part number	Serial number	Material
1	119E9674G002	213998-774	Nimonic263
2	119E9674G002	213998-778	Nimonic263
3	119E9674G002	213998-777	Nimonic263
4	119E9674G002	213998-776	Nimonic263
5	119E9674G002	213998-773	Nimonic263
6	119E9674G002	213998-775	Nimonic263

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8. SCOPE OF WORK:

Work scope	Inspect	Standard (N	Coating
Inspect			
Perform receipt inspection and record serial numbers.	X		
Perform visual inspection in dirty condition, segregate obvious scrap components	X		
Set in single fixture and perform dimensional inspection	X		
Perform metallurgical evaluation of base material and coating type, report on condition	X		
Dis assemble aft bracket from TP body, bag and tag hardware for re-use	X		
Dis assemble TP outer jacket, ensure serial No. of TP body is etched onto jacket skins	X		
Perform pre strip ultrasonic inspection.	X		
Mask internal cooling passages and abrasive blast to remove TBC coating.	X		
Performing incoming solution heat treatment in partial pressure vacuum environment	X		
Degrease components	X		
Grit blast to remove residual coating	X		
Perform visual inspection	X		
Perform fluorescent penetrant inspection	X		
Perform post strip ultrasonic inspection.	X		
Compile incoming Inspection report and forward to customer.	X		
Repair			
Blend to remove oxidation product to transition piece body		X	

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Scallop all defective areas		X	
Cold straighten Transition Piece main body to reinstate blueprint dimensions.		X	
Perform local fluorescent penetrant inspection of prepared areas		X	
Degrease and prepare for weld repair.		X	
Perform weld repairs		X	
EDM to recreate the seal slot (Thailand only)		X	
Repair by welding and blending "H " blocks to restore dimensional acceptance		X	
Blend all repaired areas		X	
Post repair heat treatments		X	
Assemble matched Aft bracket to T/P body		X	
Perform final age heat treatment		X	
Set in fixture and perform dimensional inspection.		X	
Weld in place new Extender wear strips		X	
Perform local NDT inspection to wear strip locations.		X	
Coating			
Apply Hard face coating to inlet end			X
Apply Hard face coating to support ring			X
Set up and reassemble matched T/P jackets			X
Assemble NEW U frames to Transition piece jackets			X
Perform fluorescent penetrant inspection			X
Apply Bond coat and TBC topcoat			X
Perform visual inspection			X

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Perform final inspection			X
Compile Final Report, pack and ship components with all required documentation as listed in Purchase Order			X

Required:

- Chrome Carbide inlet end, support ring & MCrAlY / TBC internal body (standard work scope).
- Replace Bolt (Inner picture frame support plate), 6 ea.
- Replace Aft bracket hardware (Bolt), 6 ea.
- Floating seals cloth seal-inner, 6 ea.
- Floating seals cloth seal-outer, 6 ea.
- Picture Frame Wear Strip (ID), 6 ea.
- Picture Frame Wear Strip (Side), 12 ea.

INCOMING INSPECTION REPORT

9.0 MATERIAL EVALUATION

Report No.	L11385		Job order no.	825089							
Serial no.(or ID)	Item# 1		Cutting location	Outlet bore							
Received status	<input checked="" type="checkbox"/> As-Received <input type="checkbox"/> Pre-Weld HT <input type="checkbox"/> Post-Weld HT <input type="checkbox"/> Other										
Analysis Result											
Main composition,%				Hardness Test	-						
Element	Co	Cr	Ni	Ti	W	Ta	Mo	Fe	Al	Grain size	-
Nominal	20.0	20.0	Bal	2.1	-	-	6.0	-	1.2	Coating Type	TBC coating
Result	18.1	19.2	52.6	1.9	-	-	6.5	-	-	Nearest Alloy	Nimonic263

Microstructure



Fig.1 Showing the hot gas path coating and substrate condition.(Etched)

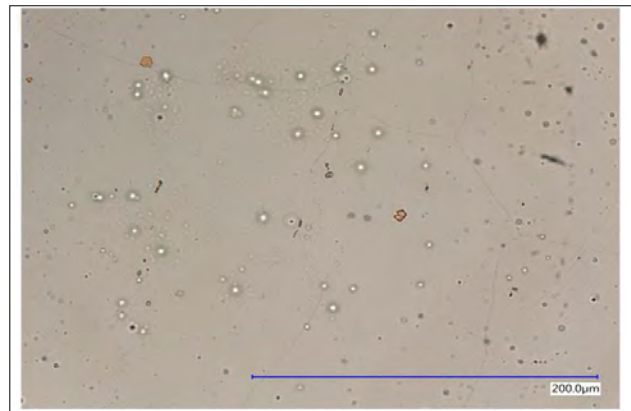


Fig.2 Showing the typical microstructure at higher magnification.(Etched)

A metallurgical specimen was extracted from Item 1 at the outlet bore location and submitted under Report No. L11385 to evaluate the base material condition and confirm suitability for repair. Examination confirmed that the hot gas path surface was protected by TBC coating, as shown in Fig.1. The base material was confirmed as Nimonic263 alloy, comprising fine grain boundary carbide and a gamma matrix with fine gamma prime, primary carbide, and dispersed secondary carbide, as shown in Fig.2. It should be noted that the gamma prime of this alloy is very fine in nature and can be further characterised by scanning electron microscopy (SEM) if required.

10.0 PHOTOGRAPHS:

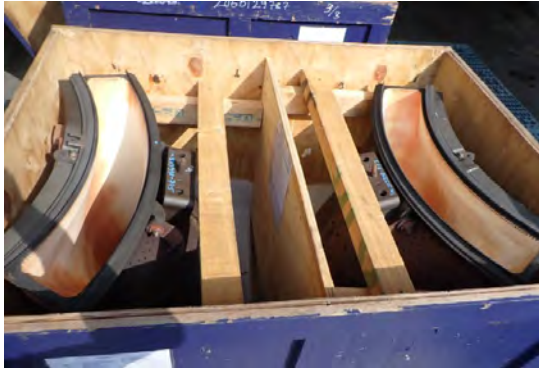


Fig.1 As-received condition.



Fig.2 As-received condition.



Fig.3 As-received condition.

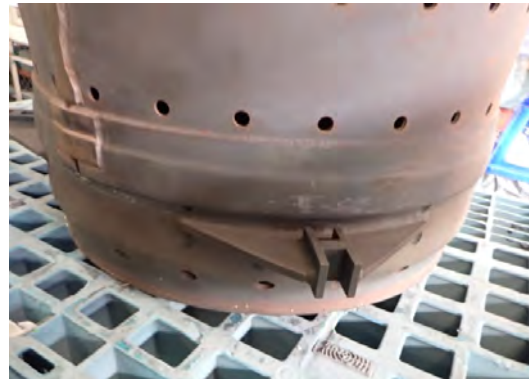


Fig.4 As-received condition.

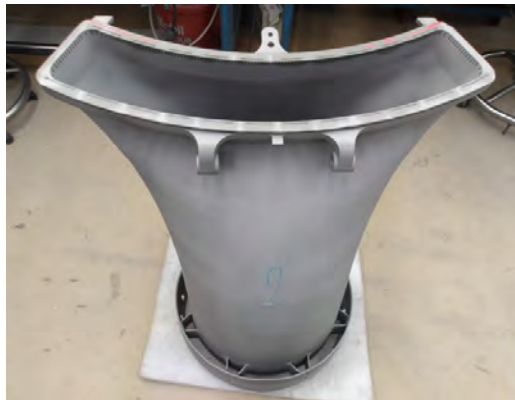


Fig.5 Typical condition of body.



Fig.6 Typical condition of body.

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Fig.7 Typical condition of body.



Fig.8 Typical condition of impingement sleeve.



Fig.9 Typical condition of impingement sleeve.

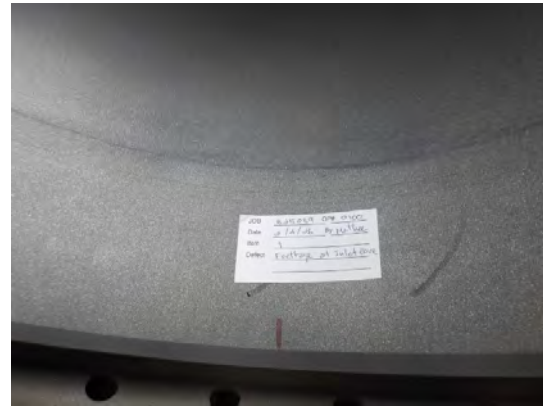


Fig.10 Frettage on inlet bore.

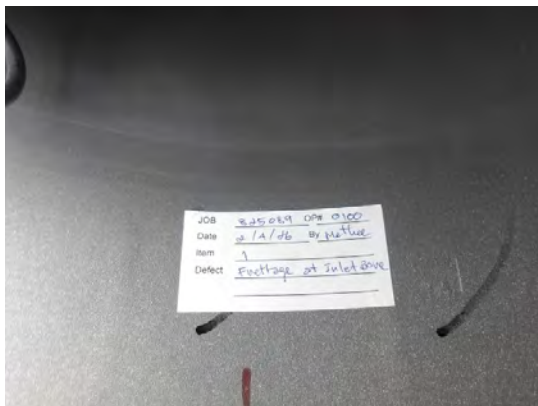


Fig.11 Frettage on inlet bore.



Fig.12 Frettage on inner picture frame wear strip.

INCOMING INSPECTION REPORT

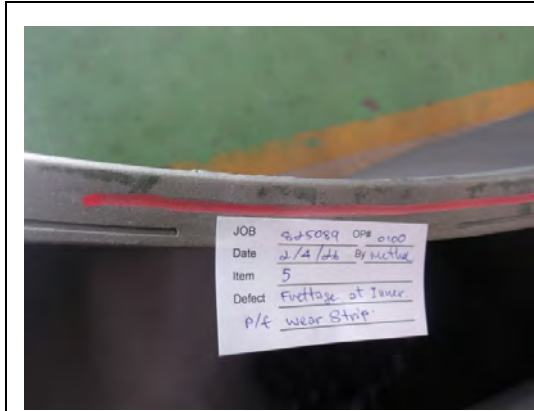


Fig.13 Fretage on inner picture frame wear strip.

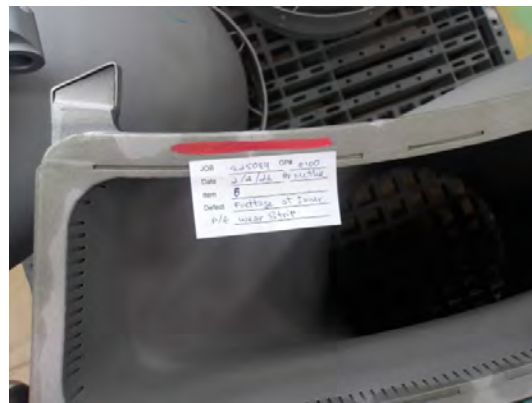


Fig.14 Fretage on inner picture frame wear strip.

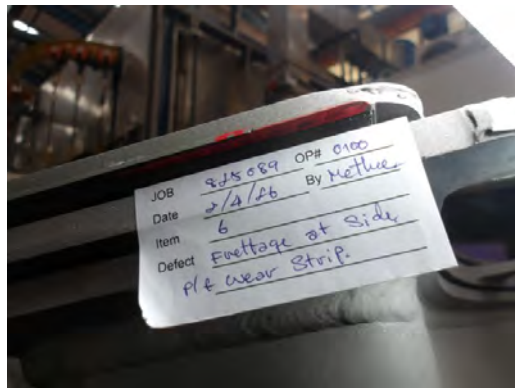


Fig.15 Fretage on side picture frame wear strip.

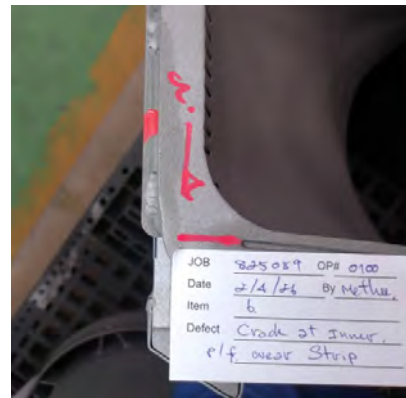


Fig.16. Crack on inner picture frame wear strip.

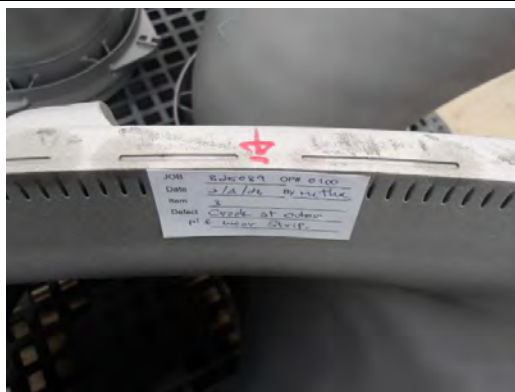


Fig.17 Crack on outer picture frame wear strip.

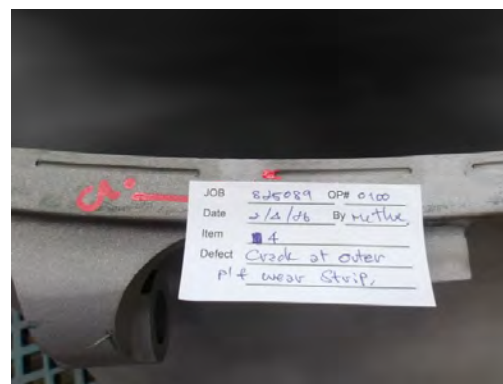


Fig.18 Crack on outer picture frame wear strip.

INCOMING INSPECTION REPORT

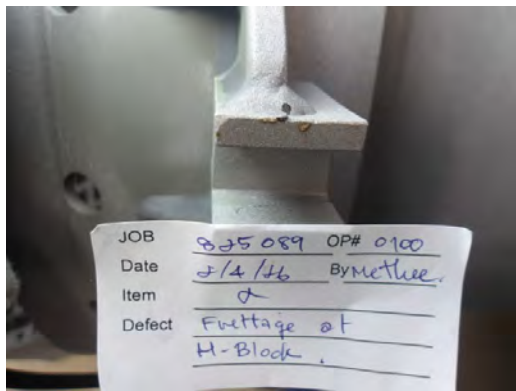


Fig.19 Fretting on H-Block.



Fig.20 Deformation on inner floating seal.



Fig.21 Deformation on inner floating seal.



Fig.22 Fretting on inner floating seal.



Fig.23 Fretting on outer floating seal.



Fig.24 Deformation on outer floating seal.

INCOMING INSPECTION REPORT



Fig.25 Deformation on outer floating seal.

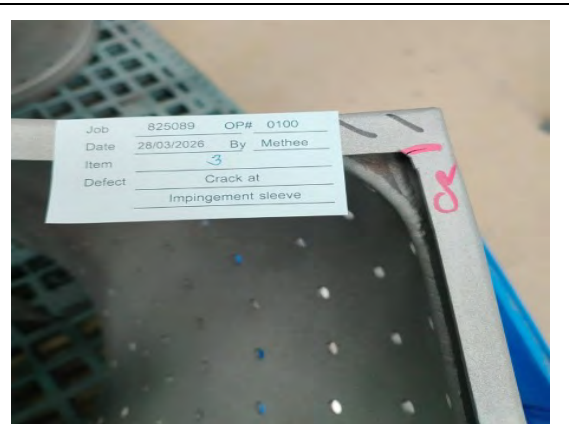


Fig.26 Crack on impingement sleeve.



Fig.27 Crack on impingement sleeve.

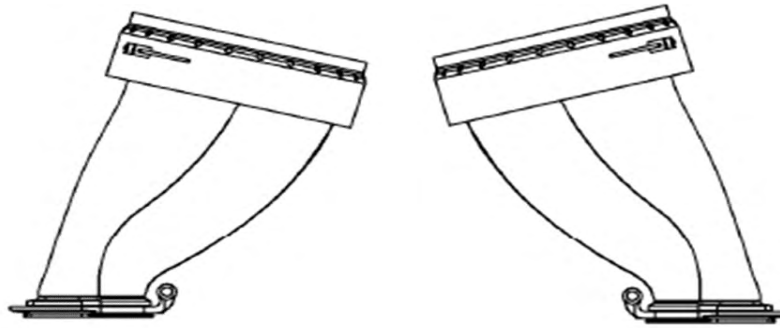
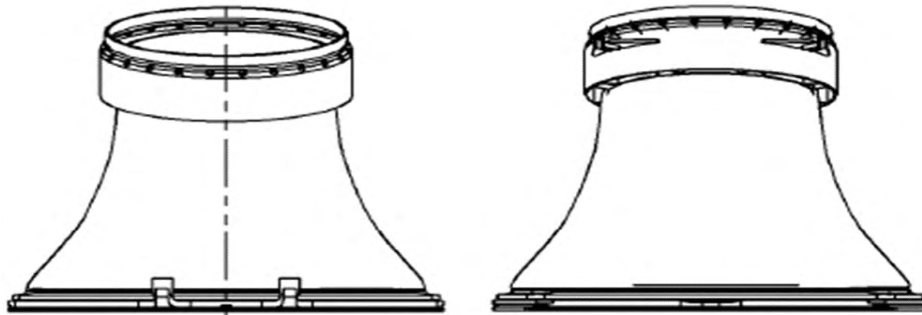


Fig.28 Fretting on impingement sleeve.

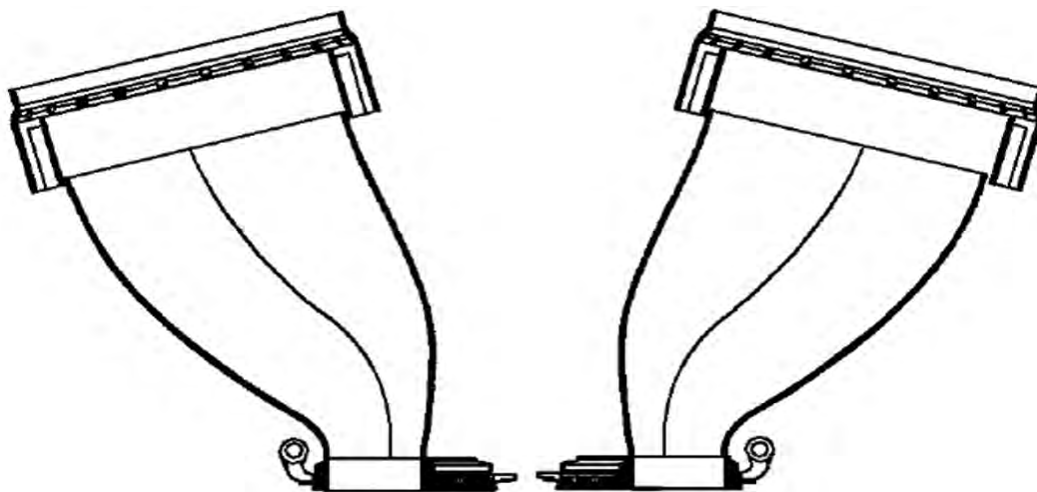


Fig.29 Fretting on impingement sleeve.

11. DEFECT LEGEND TABLE:

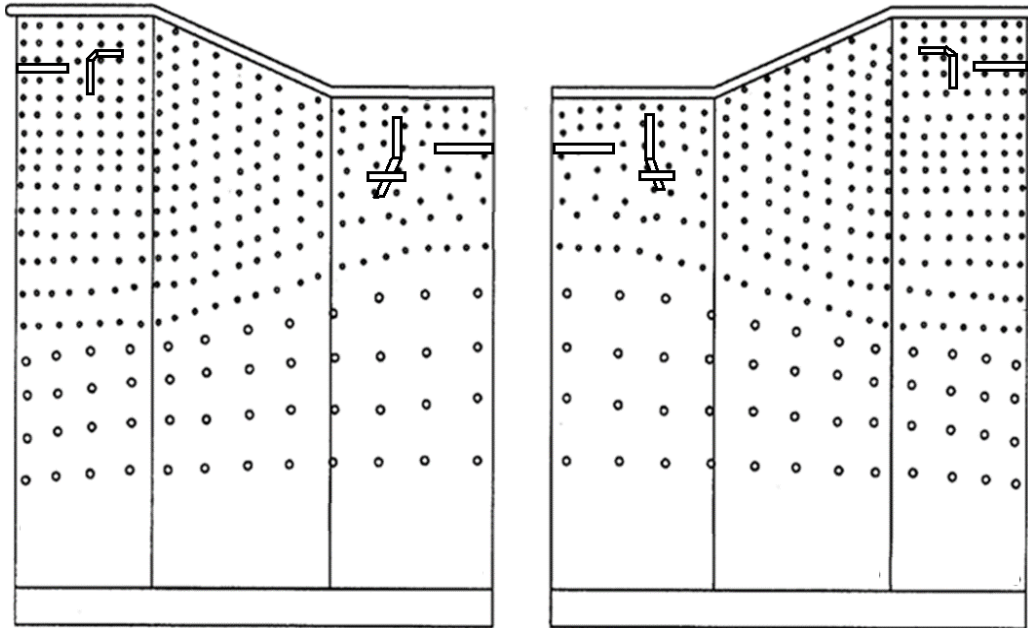


OUTSIDE VIEW

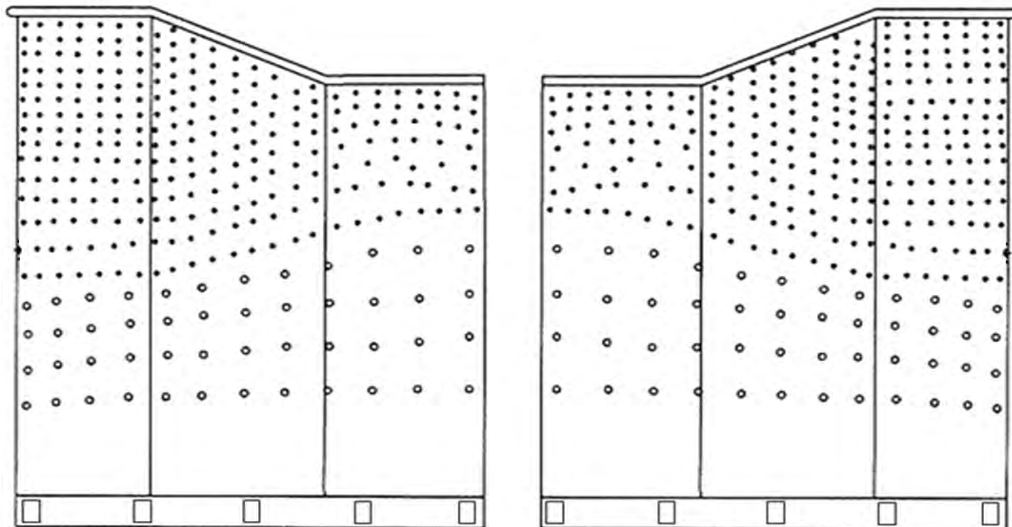


INSIDE VIEW

INCOMING INSPECTION REPORT



OUTSIDE VIEW



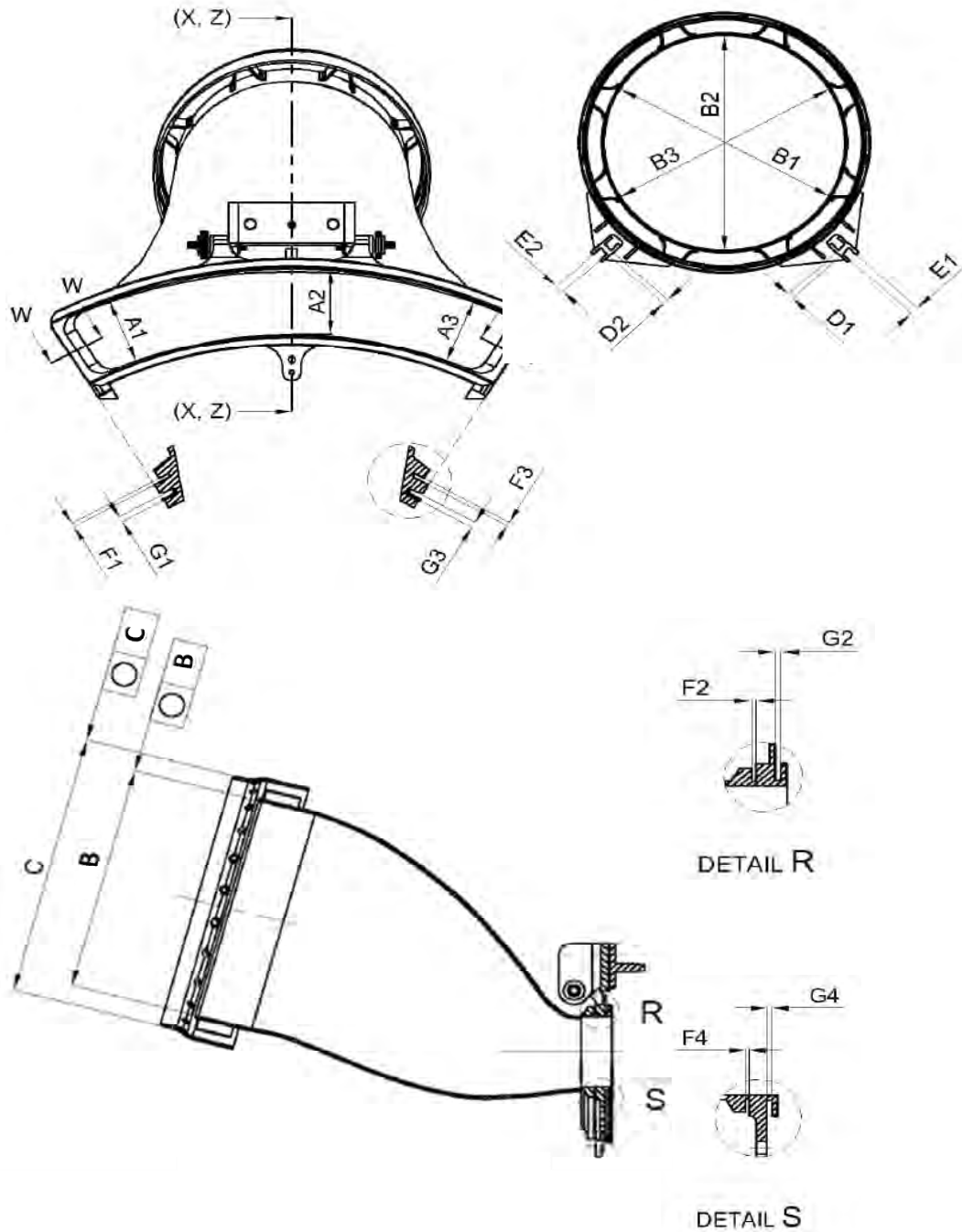
INSIDE VIEW

INCOMING INSPECTION REPORT

DEFECT TYPE/LOCATION		1	2	3	4	5	6	
INSPECTION FINDINGS	Body	Wear						
		Cracking						
		Corrosion						
		Missing material						
	Inlet bore	Wear	B	B	B	B	B	B
		Cracking						
		Corrosion						
		Missing material						
	Inner picture frame support plate	Wear						
		Cracking						
		Corrosion						
		FOD						
		Deformation						
	Impingement sleeve	Wear	B/WB	B/WB	B/WB	B/WB	B/WB	B/WB
		Cracking	WB	WB	WB	WB	WB	WB
		Corrosion						
		Deformation						
	Support bracket	Wear						
		Cracking						
		Corrosion						
		FOD	B	B	B	B	B	B
	Inner picture frame wear strip (if applicable)	Wear	R	R	R	R	R	R
		Cracking						R
		Deformation						
		Missing material						
	Outer picture frame wear strip (if applicable)	Wear						
		Cracking	WB		WB	WB	WB	
		Corrosion						
Missing material								
Side picture frame wear strip (if applicable, 2 per transition piece)	Wear	Qty	2	2	2	2	2	
		Code	R	R	R	R	R	
	Cracking	Qty						
		Code						
	Deformation	Qty						
		Code						
	Missing material	Qty						
		Code						
H-block	Wear	Qty	2	2	2	2	2	
		Code	B	B	B	B	B	
	Cracking	Qty						
		Code						
Fixture rejection	Qty							
	Code							
Inner floating seal	Wear	R	R	R	R	R	R	
	Cracking							
	Deformation	R	R	R	R	R	R	
Outer floating seal	Wear	R	R	R	R	R	R	
	Cracking							
Deformation	R	R	R	R	R	R		
DIMENSIONAL DATA	Inlet bore ID	REJ	ACC	ACC	REJ	ACC	REJ	
	Inlet bore roundness	REJ	ACC	ACC	REJ	ACC	REJ	
	Exit end	REJ	REJ	REJ	REJ	REJ	REJ	
	Wall thickness	ACC	ACC	ACC	ACC	ACC	ACC	
	H-block dimension	ACC	ACC	ACC	ACC	ACC	ACC	
	Size of PF slot	REJ	REJ	REJ	REJ	REJ	REJ	

- B = Blend repair to be performed in accordance with the location blend limits.
- JK = Jacking and contouring to be performed based on the deformation and distortion detected.
- WB = Weld and Blend to be performed based on the area limits and defects detected.
- WM = Weld and Machining to be performed to build material dimensions and restore original dimensions and contours.
- WE = Welding and Electric discharge machining (EDM) to be performed to build material dimensions and restore original dimensions.
- TPR = Transient Phase Restoration to be performed based on the defects detected.
- R = Replace with new.
- ACC = Acceptable as is.
- REJ = Dimension unacceptable and will require repair or cause of scrap.
- S = Non-repairable / Scrap
- L = Light repair category
- M = Standard (Medium) repair category
- H = Heavy repair category
- EX = Salvation repair category

12. DIMENSION INSPECTION:



INCOMING INSPECTION REPORT

Dimension Inspection										
ITEM	POSITION									
	A1	A2	A3	B1	B2	B3	B roundness	C1	C2	C3
1	127.38	128.17	127.25	394.82	393.40	396.04	2.64	455.31	454.33	458.85
2	127.38	127.88	126.62	395.01	393.95	394.69	1.06	456.85	455.49	456.51
3	127.72	128.09	126.42	395.30	393.49	394.69	1.81	457.87	456.13	456.74
4	127.19	128.00	126.77	395.90	391.78	393.26	4.12	459.68	454.89	456.88
5	126.98	127.76	126.39	395.16	393.78	395.26	1.48	457.90	455.48	457.45
6	127.23	127.91	126.72	395.65	392.86	394.79	2.79	457.98	454.68	457.38


ITEM	POSITION									
	C roundness	D1	D2	E1	E2	G1	G2	G3	G4	F1
1	4.52	9.60	9.58	14.86	14.90	3.50	3.50	3.50	3.50	4.00
2	1.36	9.44	9.48	14.71	14.78	3.50	3.50	3.50	3.50	4.00
3	1.74	9.50	9.51	14.74	14.85	3.50	3.50	3.50	3.50	4.00
4	4.79	9.35	9.56	14.85	14.91	3.50	3.50	3.50	3.50	4.00
5	2.42	9.49	9.38	14.87	14.77	3.50	3.50	3.50	3.50	4.00
6	3.30	9.56	9.42	14.86	14.93	3.50	3.50	3.50	3.50	4.00

ITEM	POSITION		
	F2	F3	F4
1	3.60	4.00	3.50
2	3.70	4.10	3.80
3	3.60	4.10	3.60
4	3.50	4.10	3.50
5	3.60	4.00	3.60
6	3.60	4.10	3.60

Unit:mm

INCOMING INSPECTION REPORT

13. DEFECT MAP:

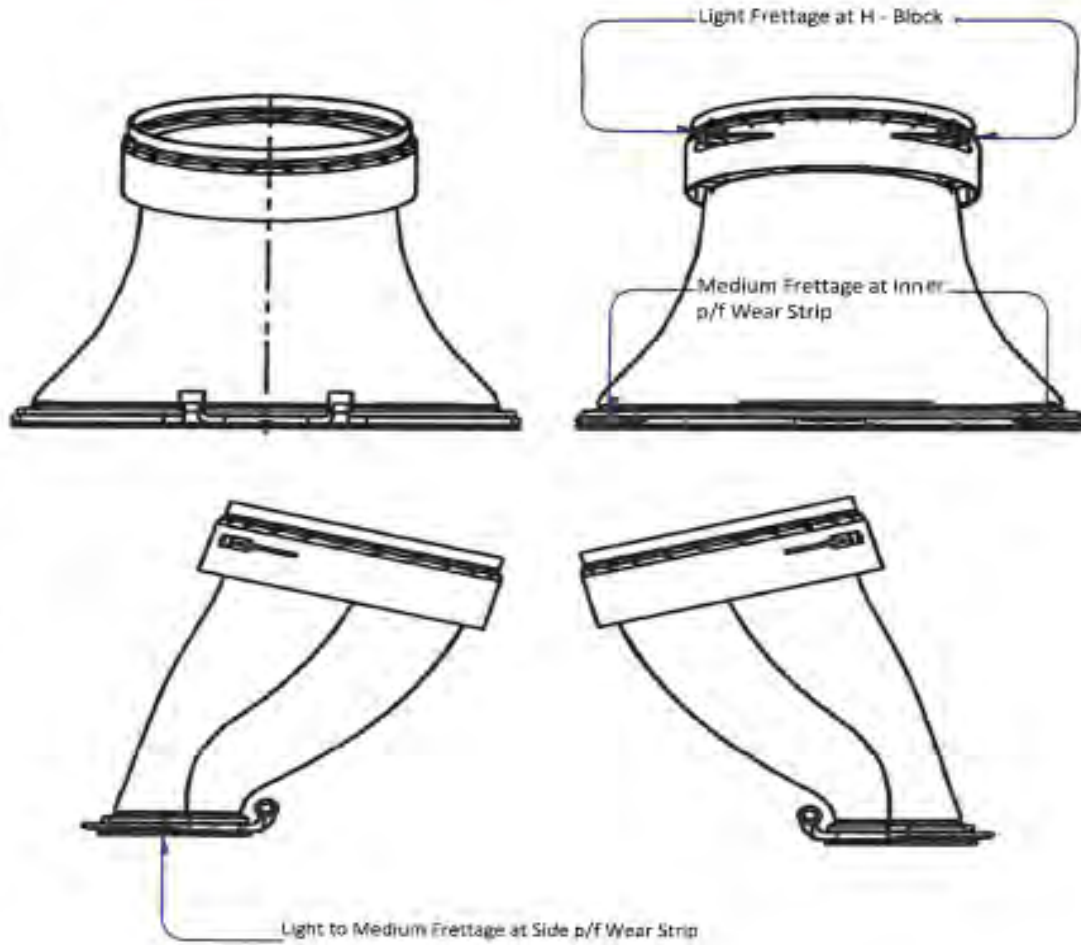
			
INSPECTION AND PROCESS RECORD SHEET	MS6001FA TRANSITION PIECE		IPRS NO. 3071-50
	PART NUMBER : GETP00M6FA		REV. 00
CUSTOMER :	Nghi Son Refinery	CUSTOMER PO :	
JOB NUMBER :	825089	OP.	0100
INSPECTED BY :	Methee	DATE :	02/04/2026



Mapping of FPI and Visual Inspection:


-  Crack (dash)
-  Foreign Object (grey) (L/M/H)
-  Pitting (L/M/H)
-  Oxidation (diagonal)
-  Corrosion (L/M/H)
-  Missing Material (L/M/H)

Unit: mm



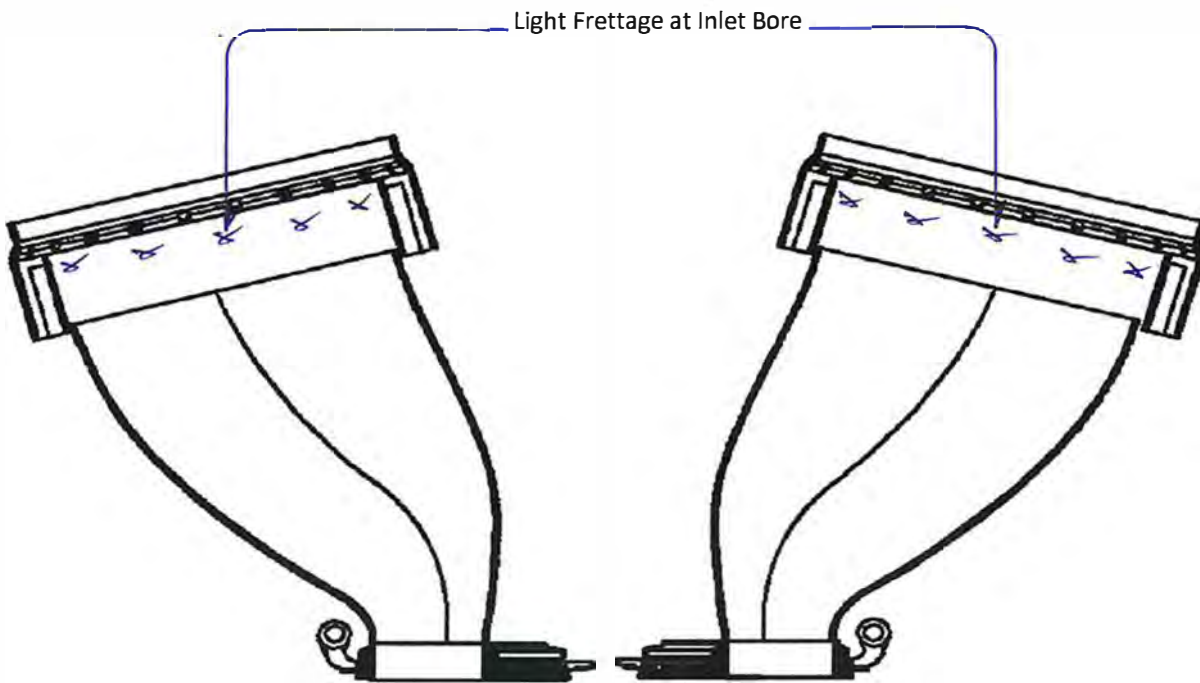
TYPICAL DEFECT

OUTSIDE VIEW

			
INSPECTION AND PROCESS RECORD SHEET	MS6001FA TRANSITION PIECE		IPRS NO. 3071-50
	PART NUMBER : GETP00M6FA		REV. 00
CUSTOMER :	Nghi Son Refinery	CUSTOMER PO	
JOB NUMBER :	825089	OP.	0100
INSPECTED BY :	Methee	DATE :	02/04/2026
Mapping of FPI and Visual Inspection:			

-  Crack (mm)
-  Foreign Object Damage (L/M/H)
-  Fretting (L/M/H)
-  Deformation area(mm²)
-  Corrosion (L/M/H)
-  Missing Material (mm²)








Unit: mm



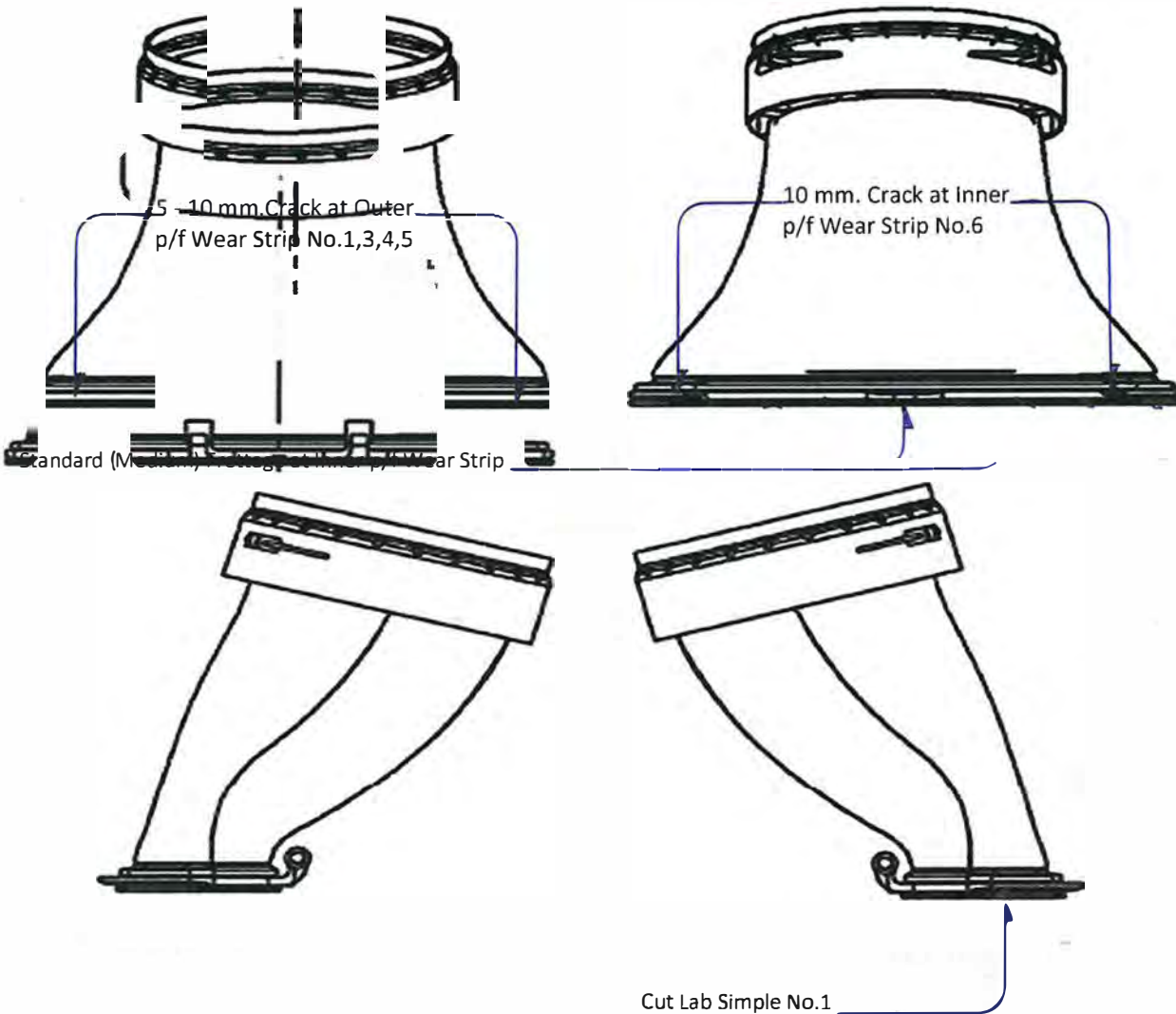
TYPICAL DEFECT

INSIDE VIEW

Work Order: 825089	MS6001FA TRANSITION PIECE
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INSPECTION AND PROCESS RECORD SHEET			IPRS NO.	3071-50	
	PART NUMBER : GETP00M6FA		REV.	00	
CUSTOMER :	Nghi Son Refinery	CUSTOMER PO			
JOB NUMBER :	825089	OP.	0100		
INSPECTED BY :	Methee	DATE :	02/04/2026		
Mapping of FPI and Visual Inspection:					
 Crack (mm)	 Foreign Object Damage (L/M/H)	 Fracture (L/M/H)	 Deformation area(mm ²)	 Corrosion (L/M/H)	 Missing Material (mm ²)

Unit: mm



NON TYPICAL DEFECT

OUTSIDE VIEW

Work Order: 825089	MS6001FA TRANSITION PIECE
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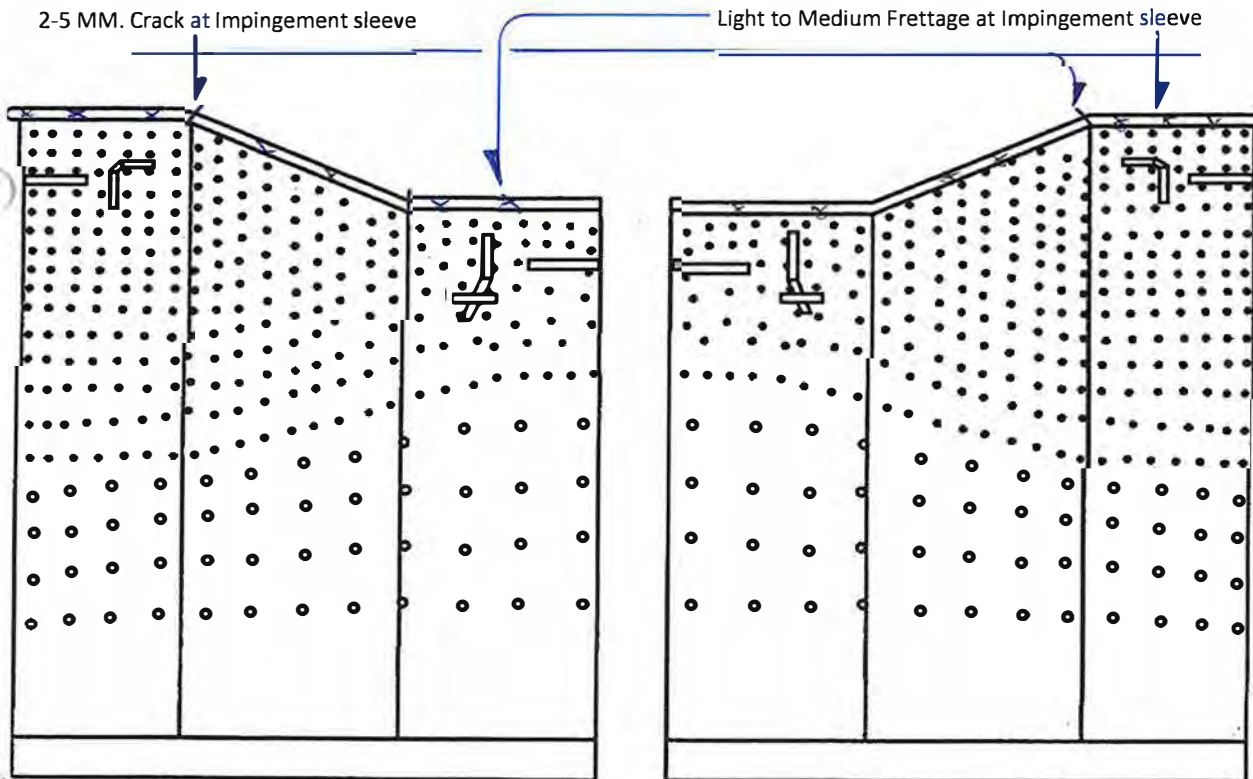


INSPECTION AND PROCESS RECORD SHEET	MS6001FA TRANSITION PIECE	IPRS NO.	3071-50
	PART NUMBER : GETP00M6FA	REV.	00
CUSTOMER :	Nghi Son Refinery	CUSTOMER PO :	
JOB NUMBER :	825089	OP.	0100
INSPECTED BY :	Methee Ph.	DATE :	28/03/2026

Mapping of FPI and Visual Inspection:

- Crack (mm)
- Foreign Object Damage (L/M/H)
- Fretting (L/M/H)
- Deformation arc(mm²)
- Corrosion (L/M/H)
- Missing Material (mm²)

Unit: mm



OUTSIDE VIEW

TYPICAL DEFECT

Work Order: 825089	MS6001FA TRANSITION PIECE
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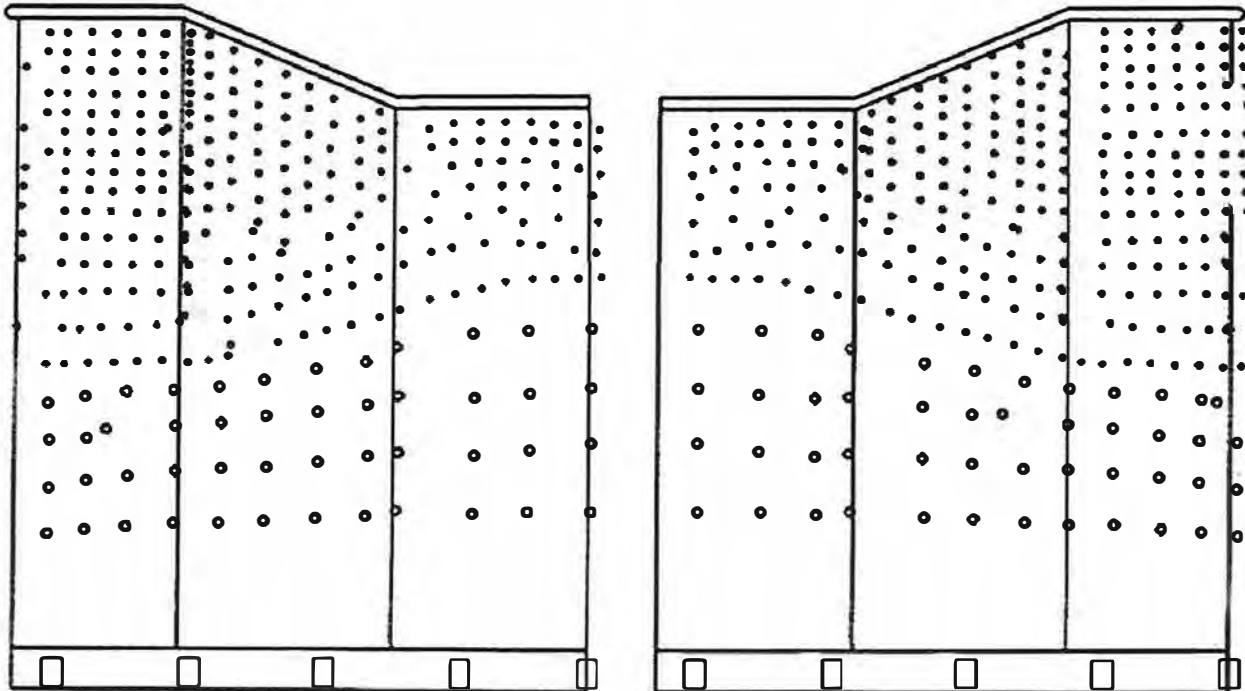


INSPECTION AND PROCESS RECORD SHEET	MS6001FA TRANSITION PIECE	IPRS NO.	3071-50
	PART NUMBER : GETP00M6FA	REV.	00
CUSTOMER :	Nghi Son Refinery	CUSTOMER PO :	
JOB NUMBER :	825089	OP.	0100
INSPECTED BY	Methee Ph.	DATE :	28/03/2026

Mapping of FPI and Visual Inspection:

- Crack (mm)
- Foreign Object Damage (L/M/H)
- Fracture (L/M/H)
- Deformation area(mm²)
- Corrosion (L/M/H)
- Missing Material (mm²)

Unit: mm



INSIDE VIEW

TYPICAL DEFECT

Work Order: 825089	MS6001FA TRANSITION PIECE
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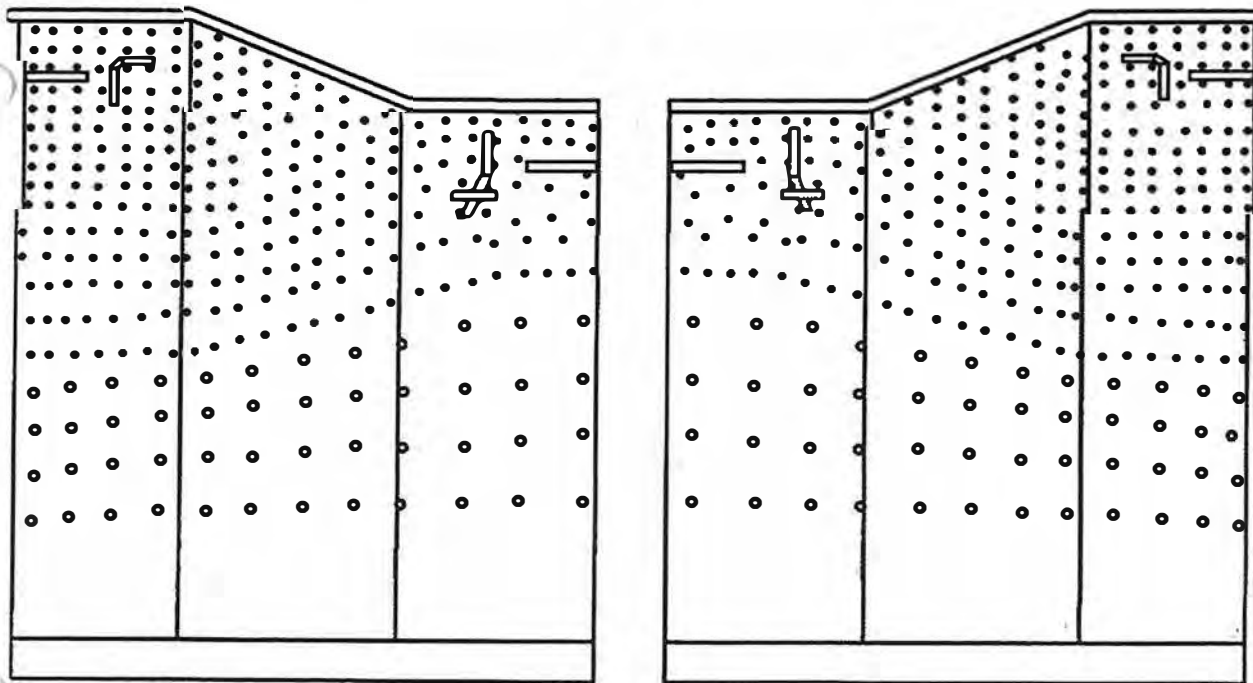


INSPECTION AND PROCESS RECORD SHEET	MS6001FA TRANSITION PIECE	IPRS NO.	3071-50
	PART NUMBER : GETP00M6FA	REV.	00
CUSTOMER :	Nghi Son Refinery	CUSTOMER PO :	
JOB NUMBER :	825089	OP.	0100
INSPECTED BY :	Methee Ph.	DATE :	28/03/2026

Mapping of FPI and Visual Inspection:

- Crack (mm)
- Foreign Object Damage (L/M/H)
- Fracture (L/M/H)
- Deformation area(mm²)
- Corrosion (L/M/H)
- Missing Material (mm²)

Unit: mm



OUTSIDE VIEW

NON TYPICAL DEFECT

Work Order: 825089	MS6001FA TRANSITION PIECE
---------------------------	----------------------------------

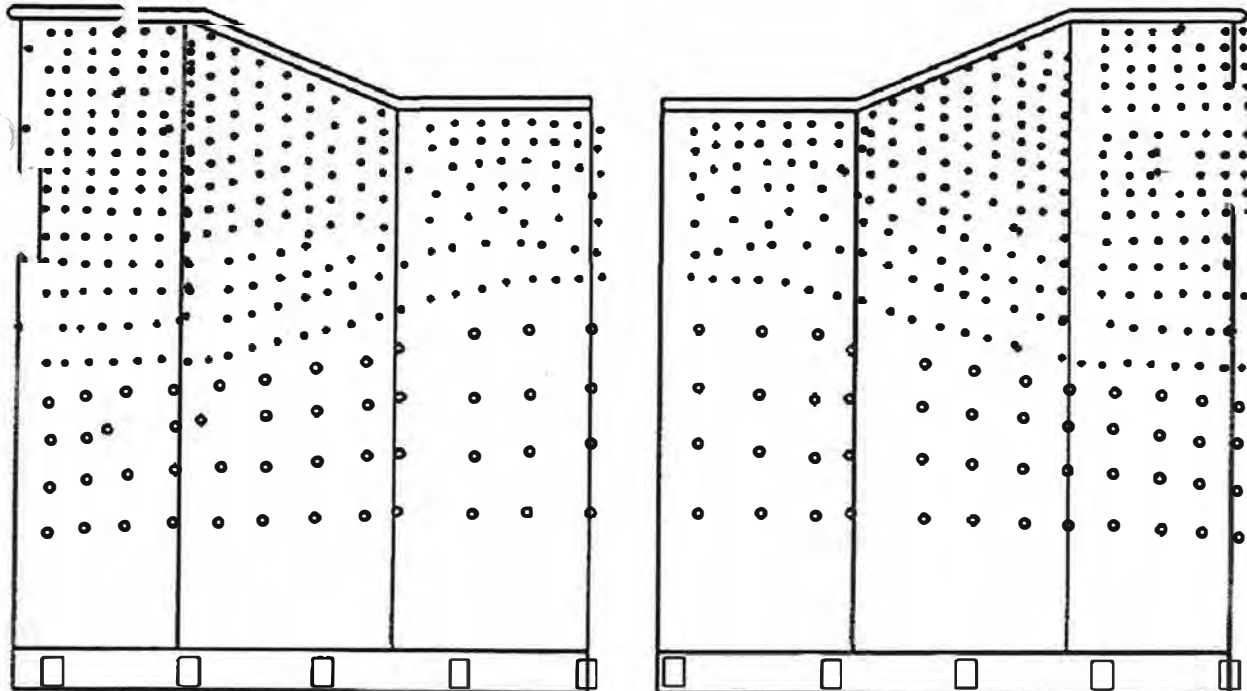


INSPECTION AND PROCESS RECORD SHEET	MS6001FA TRANSITION PIECE	IPRS NO.	3071-50
	PART NUMBER : GETP00M6FA	REV.	00
CUSTOMER :	Nghi Son Refinery	CUSTOMER PO :	
JOB NUMBER :	825089	OP.	0100
INSPECTED BY	Methee Ph.	DATE :	28/03/2026

Mapping of FPI and Visual Inspection:

- Crack (mm)
- Foreign Object Damage (L/M/H)
- Fretting (L/M/H)
- Deformation area(mm²)
- Corrosion (L/M/H)
- Missing Material (mm²)

Unit: mm



INSIDE VIEW

NON TYPICAL DEFECT

Work Order: 825089	MS6001FA TRANSITION PIECE
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Subject: Refurbishment Incoming Inspection Reports and Capital Parts Condition

Dear NSRP Team,

UNEW is submitting the incoming inspection reports for the capital parts received for refurbishment. Our comments and concerns are based not only on the parts covered in the attached reports but also on components recently received by UNEW and parts visually observed during the recent outage. Across all these groups, we have consistently seen a pattern of **severe deterioration, heavy repair requirements, and limited remaining repair life.**

Based on our inspection results and field observations, many capital parts are in poor condition and require heavy repair. We must be transparent that some of these parts have reached a condition where they would normally be recommended for retirement and replacement with new components. However, we fully understand that NSRP may not have sufficient spare parts available in the warehouse for immediate replacement or for the upcoming inspection and outage requirements. For this reason, UNEW has made every effort to evaluate and save these parts where technically possible, so that NSRP has components available to continue operating the units. Some parts may be repairable for **one more service cycle only**, and this should be carefully factored into future outage planning and spare parts strategy.

The deteriorated condition of these parts is caused by several combined factors, including:

1. Operation under severe thermal and mechanical loading conditions, with frequent starts, shutdowns, emergency trips, and load changes. Each unplanned event subjects components to intense thermal cycling that accelerates wear, cracking, and material degradation over time.
2. Long service history with a high number of accumulated operating hours and repeated refurbishment cycles beyond the original design expectation.
3. Previous repairs were carried out with the primary objective of returning the parts to service for the next operating interval only, rather than fully restoring them to their original design condition. While this approach keeps the unit running in the short term, it means that each successive repair cycle starts from a lower baseline, and the useful life of the parts becomes progressively shorter with every overhaul.
4. Many of the original parts are generic OEM components designed for a broad fleet operating range and are not fully optimised for NSRP's specific fuel composition, refinery environment, and operating profile. Over time, this mismatch accelerates coating breakdown, oxidation, fretting, and dimensional distortion.

For the current refurbishment scope, UNEW will continue to repair and save the existing parts to the maximum extent technically possible. At the same time, we respectfully recommend that NSRP consider the following long-term strategy:

5. Maintain sufficient spare parts inventory for outage and emergency readiness, and plan for the retirement of parts that have reached the end of their practical repair life.
6. For new replacement parts, consider components that are better suited to NSRP's actual operating environment, fuel properties, and thermal cycling conditions rather than standard generic OEM variants.
7. Require future refurbishment work to restore parts to the best technically achievable condition and as close as practical to the original design specification, rather than accepting a minimum standard that only supports the next interval.



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8. Track the repair history and remaining repair life of each major capital part to reduce unexpected outage risk and support more effective long-term maintenance planning.

UNEW appreciates NSRP's continued trust and remains available to discuss individual part conditions, repair recommendations, and future replacement planning. We believe it is important to share this technical advice now so that NSRP can plan future refurbishment, replacement, and spare parts requirements more effectively. Please review the attached incoming inspection reports at your earliest convenience.