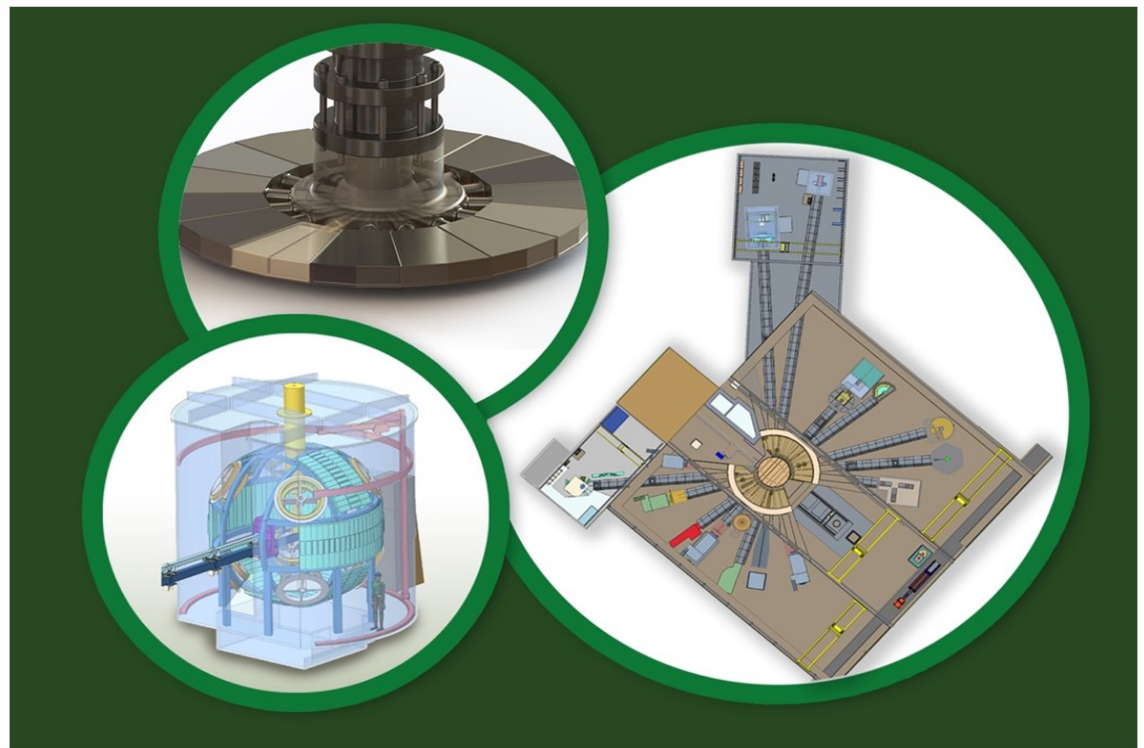


Second Target Station Factory Acceptance Test 0000001787 - Target Drive Assembly



Aaron Jacques
Lukas Bearden

July 29, 2026

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Second Target Station

**SECOND TARGET STATION
FACTORY ACCEPTANCE TEST
0000001787 - TARGET DRIVE ASSEMBLY**

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July 29, 2026

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LIST OF ABBREVIATIONS

FAT	Factory Acceptance Test	STS	Second Target Station
ORNL	Oak Ridge National Laboratory		

1. PROJECT AND ITEM INFORMATION

- **Project Name:** Second Target Station
- **Part or Assembly:** 0000001787 - Target Drive Assembly
- **Purchase order number:**
- **Company Representative:**
- **Test Location:**
- **Test Date:**

The Second Target Station (STS) project desires to perform a Factory Acceptance Test (FAT) for the 0000001787 - Target Drive Assembly prior to shipping. The FAT serves two purposes:

- Ensure that the fabricator has fabricated the parts as specified
- Ensure that the fabricator has assembled the parts as specified
- Validate that the system functions as designed

Performing the FAT at the Seller's facility reduces risk to both the Seller and the Company prior to shipment. Oak Ridge National Laboratory (ORNL) understands that the design may be fabricated and assembled according to specifications, but not meet the design intent due to a design errors or omissions. ORNL and the Seller will work together to remedy the design and perform any associated re-work required.

2. VISUAL AND MECHANICAL INSPECTION

Configuration:

- 0000001787 - Target Drive Assembly to be fully assembled in accordance with drawings and specifications.
- Weight accurate mass (15,820kg) secured to the crown (specified & provided by seller)
- Return adapters installed to emulate segments (specified & provided by seller)
- Gas (for seal) connected and regulated (connections and gas provided by Seller)
- Water Skid connected, water filled; no pressure or flow (skid, connections, and water provided by seller)

Procedure	Criteria	Pass/Fail	Comments
Inspect the system for debris, gouges or general workmanship	Free of debris, contamination, gouges or scratches		
Inspect the visible parts for labeling	All visible parts properly labeled		
Inspect the fixture or support	Support has been installed and anchored		
Measure sensor gaps	All within tolerance noted on drawing		
Verify oil fill is adequate	Overflow from exit when opened		
Verify gas line is properly connected	Connections present no audible or felt leaks		
Visually verify that the shaft emulator is present	Emulator is present all bolts have been tightened		
Visually inspect the system for blanking flanges	Flanges present bolted with gasket or sealing		
Fasteners torqued and marked?	Fasteners marked		
Control system present and connected?	All wiring connected and neatly organized		
Water testing connected	Flanges present; gasket present; bolts tightened		
Vacuum and leak testing equipment present?	Leak test equipment present vacuum test equipment present		

Table 1. Visual and Mechanical Inspection

3. FUNCTIONAL TESTING

Configuration:

- 0000001787 - Target Drive Assembly to be fully assembled in accordance with drawings and specifications.
- Weight accurate mass (15,820kg) secured to the crown (specified & provided by seller)
- Return adapters installed to emulate segments (specified & provided by seller)
- Gas (for seal) connected and regulated (connections and gas provided by Seller)
- Water Skid connected, water filled; no pressure or flow (skid, connections, and water provided by seller)

Procedure	Criteria	Pass/Fail	Comments
Turn on the control system, start the motor rotation	Successful start up, no faults		
Rotate the system at 1 RPM for 15 minutes	No faults or excessive torque		
Rotate the system at 1 RPM for 15 minutes	No faults or excessive torque		
Rotate the system at 45 rpm for 30 minutes; log and plot torque/angle	Torque variation < 10%		
Record gear lash using wire gauge	<drawing value		

Table 2. Functional Test

4. VACUUM TESTING

Configuration:

- 0000001787 - Target Drive Assembly to be fully assembled in accordance with drawings and specifications.
- Vacuum box attached and pulled to rough vacuum (1 Torr) (The seller is to provide a sealing boundary to interface with ORNL PN#s 0000017881 - BELLOWS, 345MM OD, 280MM ID, 202.5 HT, VACUUM, and 0000008761 - SUPPORT, TRANSITIONING RING.)
- Return adapters installed to emulate segments (specified & provided by seller)
- Gas (for seal) connected and regulated to 7 psi (connections and gas provided by Seller)
- Water Skid connected, water filled; no pressure or flow (skid, connections, and water provided by seller)

Procedure	Criteria	Pass/Fail	Comments
With system stationary, record the Helium leakage flow rate	< 0.015		
Rotate at 45 rpm for 45 minutes, record gas leakage rate			
Rotate at 45 RPM, perform helium leak test per ASTM A493	<0.1 Torr – L/s		
Rotate the system at 45 rpm for 30 minutes; log and plot torque/angle	Torque variation < 10%		

Table 3. Vacuum Test

5. WATER LEAK TESTING

Configuration:

- Water shroud covers removed
- Weight accurate mass (15,820kg) secured to the crown (specified & provided by seller)
- Return adapters installed to emulate segments (specified & provided by seller)
- Gas (for seal) connected and regulated (connections and gas provided by Seller)
- Water Skid connected, water filled; with 25psi and 20 gpm flow (skid, connections, and water provided by seller)

Procedure	Criteria	Pass/Fail	Comments
Rotation Speed 0 RPM, Pressure: 25psi, Flow: 20 gpm			
Observe the system for any leaks of water after 1 hour	no detectable leaks		
Remove Supply Jumper	No detectable leak immediately or after 10 minutes		
Remove Return Jumper	No detectable leak immediately or after 10 minutes		
Install Supply Jumper	No detectable leak immediately or after 10 minutes		
Install Return Jumper	No detectable leak immediately or after 10 minutes		
Rotation Speed 0 RPM, Pressure: 25psi, Flow: 20 gpm			
Remove all supply and return jumpers(ORNL PN#'s 0000001796 and 000001790); pressurize single segment to 75 psi; measure pressures and any flows on adjacent segments; record pressure and note leakages (if present). Repeat for all segments & shaft passages	No pressure or flow on other circuits		
Rotation Speed 45 RPM, Pressure: 125psi^a, Flow: 20 gpm			
Observe the system for any leaks of water after 1 hour	No detectable leak		
Rotation Speed 45 RPM, Pressure: 125psi^a, Flow: 20 gpm			
Observe the system for any leaks of water after 1 hour	No detectable leak		

^a Remove all 0000018053 - RUPTURE DISC and plug prior to performing test.

Table 4. Water Leak Test

5.1 MAINTENANCE FUNCTION TESTING

Configuration:

- Fully assembled
- No water or gas connected
- Without suspended mass

Procedure	Criteria	Pass/Fail	Comments
Remove and re-install water covers (0000017978)	Remove and install without binding or forcing		
Remove and re-install manifold	Remove and install without binding, forcing or damage		
Remove and re-install motor (ORNL PN# 0000001799)	Remove and install without binding, forcing or damage		
Remove and re-install Bearing assembly (ORNL PN# 0000001799)	Remove and install without binding, forcing or damage		

Table 5. Maintenance Function Tests

6. ACCEPTANCE SUMMARY

- Accepted - Equipment is accepted with the following exceptions (listed below, if applicable)
- Rejected - Corrections required (listed below)

6.1 ACCEPTED EXCEPTIONS

6.2 CORRECTIONS REQUIRED

6.3 FINAL SIGNATURE

Seller's Representative

- Name: _____
- Title: _____
- Signature: _____ Date: _____

ORNL Representative

- Name: _____
- Title: _____
- Signature: _____ Date: _____