



INSTRUCTIONS AND GUIDELINES

Daily Container X-ray Maintenance September 2009

**This Instruction & Guideline refers to Practice Statement No:
PS2009/22 – Inspection and Examination of Sea Cargo**

Published date: 13 August 2009
Availability: Internal and External
Subject: Daily Container X-ray Maintenance
Purpose: Provide procedures to be followed when conducting start up, maintenance and daily checks for the X-ray machines
Owner: National Director Cargo
Category: Operational
Contact: National ISO coordinator, Sea Cargo Improvement

The electronic version published on the intranet is the current Instruction and Guideline

Summary of main points

These Guidelines provides procedures that must be followed for the Container X-ray Machines as part of the start up procedure and as required during the day.

This National Guideline applies to staff and facilities in the following locations:

- Container Examination Facilities in Brisbane, Fremantle, Melbourne and Sydney

Introduction

Maintenance is vital in ensuring that the MB1215 and MT1213 container X-ray systems are operating at optimum levels.

Maintenance conducted by Customs and Border Protection officers consists of very basic checks and maintenance and at no stage will Customs and Border Protection officers be expected to pull apart equipment or operate inside electronic equipment cabinets.

Instructions and Guidelines

The following maintenance and checks need to be conducted as part of the start up procedure and as required during the day.

A checklist has been developed and must be completed as required. When completed this checklist must be given to the team leader for perusal and follow up action.

The accelerator takes about 15 minutes to fully warm up. Once the accelerator is fully warmed up there are a number of temperatures and gauges that need to be checked inside the Accelerator Cabin.

The two officers conducting the start up procedure should also conduct the daily maintenance as part of the start up procedure.

Any discrepancies are to be notified to the Team leader immediately – (see faults and problems below).

Daily checks should be completed on the following items:

1. Check the Water Temperature/pressure/flow

The water needs to be at a certain temperature pressure, and flow.

- The temperature gauge is located on the front panel of the water chiller
- The pressure gauge is located on the front panel of the water chiller
- The flow gauge is located on the side of the x-ray head nearest the water chiller

2. Check Gas pressure

The role of the gas is to prevent arcing in the magnetron waveguide.

- The gas pressure gauge is located on the side of the x-ray head closest to the water chiller.

3. Check the high and low Voltage hours

The number of low and high voltage hours need to be recorded daily.

- The gauges are located on the front panel of the modulator cabinet.

4. Check the Titanium Pump voltage and current

The titanium vacuum pump ensures there is a high vacuum within the accelerating tube.

- The Titanium Pump voltage gauge is located inside the modulator cabinet
- The Titanium Pump current gauge is located inside the modulator cabinet

5. Check the Electron Gun Filament voltage and current

Record the filament voltage and current to ensure it is operating at the correct levels.

- The Filament voltage gauge is located on the front of the modulator cabinet
- The Filament current gauge is located on the front of the modulator cabinet

6. Check the Magnetron Filament voltage and current

The role of the magnetron filament is to supply the power to the accelerator tube.

- The Magnetron filament voltage gauge is located on the front of the modulator cabinet
- The Magnetron filament current is located on the front of the modulator cabinet

7. Check the Atmospheric Temperature and humidity:

Temperature and humidity needs to be checked to ensure the cabins are cooled accordingly. Periodically during the day (e.g. 1000, 1330 & 1800hrs, actual times will depend on shift patterns) the temperature and humidity of the scanning unit cabins must be checked and recorded to ensure the cooling systems are working.

- The temperature/humidity gauge is located on the wall above the collimator & to the left of the door opening inside the Image Acquisition Cabin

FAULTS OR PROBLEMS

Any faults or anomalies identified through the above checks are to be reported to the Team Leader and through him/her, to the on-site Nuctech technician – or their counterpart in other regions.

The fault should also be reported in the Faults data base and noted in the Container X-ray log with particular attention to the down time

The Site Radiation Safety Awareness Officer should also be informed and through him/her the National RSO if appropriate.

The Scanner should not be operated until the problem is rectified – refer CEF Business Continuity Plan if required.

Annexes:

- MB1215 Daily Maintenance Checklist-Annex A

Related Policies and References

Practice Statements:

- Inspection and Examination of Sea Cargo

Other Instructions & Guidelines

- Scanning Hall Procedures Instruction and Guideline
- OH&S Instructions and Guidelines

Key Roles and Responsibilities

National ISO Coordinator, Sea Cargo Improvement, Canberra
CEF Managers

Consultation

Internal

The following internal stakeholders have been consulted in the development of these Instructions and Guidelines.

- CEF Management
- Sea Cargo Improvement

Approval

Approved on	11 August 2009	(signature)
By	Jaclyne Fisher National Director Cargo	
Review Period	Annually	

MB1215 DAILY MAINTENANCE CHECKLIST

- Officers must have the Safety Interlock Key with them when entering the Scanning Hall.
- Two Officers must be present at all times during start-up and shutdown procedures
- If actual readings are not within the normal range, notify Team Leader immediately
- Use the numbered labels to assist in identifying the correct gauges
- All readings outside parameters must be referred to Supervisor Scanning hall and a note must be made of the result of the referral. EG “Technician advised – OK for today”

DATE	ACCELERATOR START TIME		OFFICER 1	OFFICER 2	
LOCATION	PROCEDURE	GAUGE	NORMAL RANGE	ACTUAL READING	
WATER CHILLER	1	Water temperature	22 – 28		°C
	2	Water outlet pressure	0.20 – 0.40		MPa
X-RAY HEAD	3	Water flow — left	1.35 – 1.70		G/Min
	4	Water flow — middle	1.35 – 1.70		G/Min
	5	Water flow — right	1.35 – 1.70		G/Min
	6	SF6 gas pressure	0.16 – 0.20		MPa
PULSE MODULATOR CABINET	7	Fil. Hours			Hrs
	8	H.V. Hours			Hrs
	9	Gun Fil Current	1.8 – 2.5		A
	10	Gun Fil Voltage	8 – 13		V
	11	Mag. Fil Current	8 – 9		A
	12	Mag. Fil Voltage	10 – 15		V
	13	Vac. Current	6 – 16		µA
	14	Vac. Voltage	3 – 4.5		kV
TIME <i>*suggested</i>	ACCELERATOR CABIN		ELECTRONIC DEVICE CABIN		OFFICERS
	HUMIDITY %	TEMP °C	HUMIDITY %	TEMP °C	
	(NORMAL RANGE 0 – 95%)	(NORMAL RANGE 15° – 35°)			
10:00					
13:30					
18:00					
NOTES: Report by exception issues with safety equipment					