Division / Business Unit:	Engineering and Systems
Function:	Signalling
Document Type:	Engineering Instruction

Asbestos Risk for Signalling Personnel – UM71 Track Circuits

ESI-07-08

Applicability

ARTC Network Wide

Publication Requirement

Internal / External

Document Audience & Main Points

Audience	Main Points
Signal Maintenance Engineers Signal Maintenance Teams Signal Asset Engineers Signal Electricians Team Leaders Signal Design	• Some UM71 (CSEE) SI units may contain asbestos. • These units should not be opened by signalling personnel. • Special precautions are to be followed for maintenance, fault finding or when replacing affected units. • The identification, recording, labelling and replacement of affected units are to progress.

Document Status

Version #	Date Reviewed	Prepared by	Reviewed by	Endorsed	Approved
1.0	12 Sep 22	Standards	Stakeholders	Manager Signalling Standards	A/General Manager Technical Standard 15/09/2022

Amendment Record

Amendment Version #	Date Reviewed	Description of Amendment
1.0	12 Sep 22	First issue of engineering instruction.

Scope:

This document provides the safety precautions to be undertaken for working on UM71 (CSEE) track circuit SI units (also known as air-cored inductors) where asbestos may be present.

Background:

A small amount of asbestos-bearing product has been reported in UM71 (CSEE) track circuits equipment by the Hunter engineering team. The minimisation of any risk to staff and the eventual removal are a high priority.

UM71 (CSEE) track circuit SI units with serial numbers before AB19782, manufactured prior to September 1987, are confirmed by the manufacturer to have been used in an inter-winding spacer material that contains asbestos. The inter-winding spacer material is fully enclosed within the tape bandage that also encloses the SI unit winding. They can be identified by the distinct X on the lid (as per Figure 1 below).

Figure 1: External view of UM71(CSEE) SI Unit

Figure 2: Internal view of UM71(CSEE) SI Unit

If the taping which encloses the winding is not damaged or removed, SI units do not pose a hazard in normal use. However, due to the age of the SI units and possible degradation of protecting material, additional precautions are to be taken to eliminate any possibility of exposure to the maintenance personnel as mentioned further in this document.

Required Actions:

Action for identification and labelling:
A Work Order Task needs to be created to inspect each CSEE type asset as nominated in the Ellipse equipment register. This task should be carried out during the next MST inspection (which typically occurs at 6-months intervals).

Inspect RX and TX trackside units (without removing covers) for UM71 to identify if it has the distinct X on the front covers as per Figure 1 above. If yes, please affix the Asbestos identification marker to the trackside units.

Do not open the lid to check the manufacturing date.

Record the finding in the Ellipse Work Order Task including transmitter or receiver end, track circuit number and location.

Action for maintenance:

UM71 SI Units are also known as Air Cored Inductors.

Service Schedule SX7311 and SX7312 (EGI – TD0731 – Train Detection Frequency CSEE) require these units to be examined for evidence of physical damage or environmental damage and to inspect all electrical connections and wiring within SI (Air Cored Inductor). This maintenance activity is exempted for affected UM71 SI Units. For these SI units, only external examination, without units being opened shall be undertaken.

Signal maintenance personnel are advised NOT to remove the lids of the identified SI Units for the purpose of maintenance inspections, cleaning, or fault-finding activities.

Action for fault findings:

The following can be used for guidance while performing fault finding on UM71 track circuit SI units.

Test	Test Equipment	Test Point Terminals	Readings	Checks	Action If Not Compliant	Condemning
Impedance at GIVEN FREQUENCY	FSM (Excluding TFA) AC Current Clamp	SI Voltage mV V1/V2 Current Using Current Clamp and FSM	Use readings to calculate impedance and compare it with Table	$Z=\frac{TU(mV)}{I(A)}$	Check that the vandal-resistant cover is not the cause of the error. See note. Change out SI Unit	See Table below
DC current through SI	DC Tong for Traction current.	One SI rail connection.	Typically, less than 20A.	Traction arrangements.	Investigate traction return imbalance and traction tie-ins. Check SI impedance.	>100A
DC Voltage due to traction return	DMM on Vdc	V1 / V2	Typically, between -0.05 and +0.05Vdc with trains nearby.	Traction imbalance exceeding SI rating	Investigate traction return imbalance and traction tie-ins.	> +0.5Vdc or < -0.5Vdc.

Z at 1700Hz	Z at 2000Hz	Z at 2300Hz	Z at 2600Hz
331<Z<385mΩ	389<Z<453mΩ	448<Z<520mΩ	506<Z<588mΩ

Note: Metallic vandal resistant covers (particularly made from Aluminium) can reduce the impedance of SI units.

Action for repair or replacement:

All Contaminated units are to remain in-situ. Replacement units can be temporarily affixed/mounted until the failed contaminated unit can be safely removed by a licensed asbestos removalist. The track circuit shall be recertified in accordance with ARTC procedure SES 06 – CSEE UM71 AF Jointless Track Circuits - Set up, Test and Certification.

Further Actions:

Business Unit shall:

- Identify, record, and label affected UM71 (CSEE) SI units with asbestos identification markers at the earliest opportunity.
- Implement a management plan for replacement of affected UM71 (CSEE) SI units.