Inspection report

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| **Licence holder:** Bureau of Meteorology (BOM) | **Licence number:** S0005 |
| Location inspected: Cape Grim Baseline Air Pollution Station, Smithton, Tasmania  | **Date/s of inspection:** 03 July 2018 |
| **Report no:** R18/08378 |
| An inspection was conducted as part of ARPANSA’s baseline inspection program. For the purposes of this inspection, the inspector did not enter the licence holder’s premises; instead the inspection was conducted using documents, photographs, and records sent by the licence holder, and further clarification via phone or email as necessary. In this instance, the inspector was able to arrange a meeting at the BOM head office at Docklands, Melbourne to discuss the outcomes of the e-Inspection.The purpose of the inspection was to assess compliance with the *Australian Radiation Protection and Nuclear Safety Act 1998* (the Act), the Australian Radiation Protection and Nuclear Safety Regulations 1999 (the Regulations), and conditions of Source Licence S0005. The scope of the inspection included an assessment of the BOM’s performance against the Source Performance Objectives and Criteria. BackgroundThe BOM operates a baseline air pollution monitoring station at Cape Grim, Tasmania. The BOM is licensed under section 33 of the Act to deal with controlled materials in gas chromatography equipment containing Ni-63 above the exemption activity for environmental monitoring, calibration sources of Ra-226 for radon detection instruments and Kr-85 in an aerosol neutralizer used in the calibration of aerosol-particles counting instrument for environmental monitoring at the site. They are also licensed to deal with controlled apparatus in particular an embedded laser in a photo acoustic extinctionometer for environmental monitoring.The main codes and standards applicable to these sources are:* Australian Standard *Safety in Laboratories - Ionizing Radiations (1998)* (AS 2243.4-1998)
* Radiation Protection Series No. 11 *Code for Practice for the Security of Radioactive Sources (2007)*
* Australian/New Zealand Standard *Safety in laboratories – Non-ionizing radiations-Electromagnetic, sound and ultrasound (2004)* (AS/NZS 2243.5:2004)
* Australian/New Zealand Standard *Safety of laser products Part 1: Equipment classification* (AS/NZS IEC 60825-1:2014)
* Australian/New Zealand Standard *Safety of laser products Part 14: A user’s guide* (AS/NZS IEC 60825-14:2011)

ObservationsIn general, the information provided for the baseline inspection shows the management of safety margins in relation to controlled material and controlled apparatus for the Cape Grim Baseline Air Pollution Station to be satisfactory.In relation to the Ionizing [sic] Radiation Safety Procedure (IRSP), the Plans and Arrangements for Nuclear Materials (PANM) and the Laser Safety Procedure (LSP) there appeared to be room for improvement in relation to:* Inconsistencies and ambiguities noted within the documents such as reference to non-ionising radiation within the IRSP document, renaming the PANM to the Plans and Arrangements for Radioactive Sources, removing any reference to lasers in the PANM and updating the LSP for outdated standards.
* There was no evidence that the Laser Safety Officer (LSO) had recorded the results of interlock checks during routine inspections as required in the LSP document.
* The radioactive sources plans and arrangements (PANM) did not contain any information as to its version control, although it was marked with a date.

Rectifying these issues would strengthen the documents relevance to the specific work being carried out at the station. The licence holder has also declared that no unsealed radioactive source work is being carried out at Cape Grim Baseline Air Pollution Station.Performance Reporting VerificationsThe BOM’s quarterly reports have been submitted to ARPANSA in a timely manner and contain relevant information on internal audits, safety improvements and the review of Plans and Arrangements in compliance with the Act and the Regulations. The Radiation Protection Advisor (RPA), located at head office in Melbourne, coordinates the information for the quarterly reports. The RPA and Laser Safety Officer (LSO) consult with Work Health and Safety section of the BOM on all aspects of the safe use of radioactive sources and laser apparatus. The Cape Grim site also has a Radiation Safety Officer (RSO).Inspection, Testing and MaintenanceThe RPA conducts annual inspections at the Cape Grim Baseline Air Pollution Station. The last annual Radiation Safety Practices Audit was done in August 2017, which focused on the following:* Training requirements
* Up to date calibration of radiation meters
* Sealed sources including signage at entrance to laboratory, labelling of sources, storage, radiation surveys, SOP and shielding.

TrainingAll personnel using the controlled apparatus or controlled material at the Cape Grim Baseline Air Pollution Station are required to undertake training related to the particular type of source. Access to radiation sources are restricted to authorised technical staff. The ARPANSA inspector was provided with records for the RPA, LSO and RSO as having completed the laser safety (LSO) and radiation safety officer training courses (RPA, RSO). The BOM LSO has developed a Cape Grim Laser Safety Course, which is comprehensive and covers laser physics and laser safety for internal training.Event Protection and Emergency Preparedness and ResponseThe building has a back to base fire alarm system with sprinklers that is monitored 24 hours a day.SecurityThe RPA maintains the security plan ‘Security Arrangements for the BOM Radioactive Sources’ document which was last reviewed in August 2017. The sealed sources are either enclosed within an instrument or locked in a steel cabinet in a secured building with appropriate signage. The building has a break in alarm system that is monitored 24 hours a day. The station is also enclosed by private land and does not have public access. The BOM complies with the requirements of the Code of Practice for Security of Radioactive Sources (RPS11) for Category 5 sources.Radiation ProtectionPhotographic evidence provided show that appropriate warning signs and labels are displayed at the entrance and on the instruments containing controlled material or controlled source. BOM has demonstrated a commitment to radiation protection by establishing procedures to facilitate the safe and effective use of radiation and the safe storage of radioactive sources at the Cape Grim Baseline Air Pollution Station. The last radiation survey of the sealed radioactive sources was performed in August 2017. Dose rates in the office, the laboratory and the steel storage cabinet taken during this survey were not significantly different to the background radiation level. A copy of the survey was provided to the inspector.There is a Class 4 laser inside a sealed/interlocked photo acoustic extinctionometer instrument with no exposed beams under normal operations. A risk assessment for the embedded laser highlighted the potential hazard of laser injury during a laser alignment or replacement process. A standard operating procedure has been developed for the procedure.Appropriate laser protective eyewear are provided in the laboratory.FindingsThe licence holder was found to be in compliance with the requirements of the Act, the Regulations, and licence conditions. The inspection revealed the following **areas for improvement**:1. The Ionizing Radiation Safety Procedure, Plans and Arrangements for Nuclear Materials and the Laser Safety Procedures need to be reviewed for internal consistency
2. The PANM lacks version control information
3. Implement a process to record the results of interlock checks

It is expected that improvement actions be taken in a timely manner. |