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EME HAZARD MANAGEMENT PROCESS



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1 About this document

Purpose: The purpose of this document is to ensure that all employees, contractors and visitors who are required to access transmitter buildings, structures and site compounds are familiar with the management procedures for any RF EME Hazards on site. This document also ensures that the General Public are not exposed to fields above that prescribed by the ARPANSA RPS3 standard which is a legislative requirement policed by ACMA (Australian Communications and Media Authority).

Scope: The scope of this document is to describe the procedure for managing risk to General Public and Occupational Exposure to RF EME Fields at BAI Communications sites. It is also to assist BAI Communications staff, contractors and visitors with understanding the process and procedures BAI Communications internal or comparable documents for non BAI organisation required for a safe working environment.

2 Definitions

The following definitions are used in the body of this document.

Term	Definition
WHS	Work Health and Safety
HR	Human Resources
EME	Electromagnetic Emission
ACMA	Australian Communications and Media Authority
ARPANSA	Australia Radiation Protection & Nuclear Safety Association
RPS3	Radiation Protection Standard Number 3
ICNIRP	International Association of Testing Authorities (Australia)
NATA	National Association of Testing Authorities (Australia)
RFNSA	Radiocommunication National Site Archive
MCF	Multi Carrier Forum
NOC	Network Operation Centre
PEL	Public Exposure Limit
OEL	Occupational Exposure Limit

3 Responsibilities

The following entities are responsible for the adherence to this Procedure.

Role	Responsibility
BAI Communications Staff	Site Access and Control
Authorised Contractors	Site Access
Authorised Visitors	Site Access
Authorised Site Sharing Entrants	Site Access

4 Introduction

RF EME (Radio-Frequency Electro-Magnetic Emission) hazards are likely to occur throughout a range of wireless related work activities and work sites. RF EME Hazards can occur through exposure to non-ionising radiation or physical contact with operating RF equipment.

The regulatory body for RF EME fields in Australia is the Australian Communication and Media Authority (ACMA) in conjunction with the Australian Radiation & Nuclear Safety Agency (ARPANSA) and the regulatory standard is provided in document RPS3. Along with defining the allowable exposure limits and the obligations of a facility owner to protect the public, the RPS3 standard defines the qualification of and responsibility of an RF Worker.

Safe work with RF EME will involve the identification of hazards along with the application of the controls of elimination, or isolation, and the use of Personal Protection Equipment (RF Protection Suits) as required. Safe work with RF EME fields will also involve adherence to the instructions provided by facility owners.

The RPS3 standard defines two thresholds of human exposure to RF EME fields. For fields up to the General Public Exposure Limit (PEL), all members of the general public cannot reasonably be expected to be aware of, avoid or minimise exposure.

For fields up to the Occupational Exposure Limit (OEL), only qualified workers (i.e. RF Workers) may access these areas as they can take further hazard preventive and minimisation measures to protect their own wellbeing and recognise any hazards above the OEL.

The RPS3 standard allows RF Workers to supervise members of the general public if transitional access is required to areas above the PEL, but not the OEL.

RF Workers are permitted to access areas with field strengths above the OEL but must undergo specific training and pass assessment in the use of RF Protection Suits. BAI permits RF Workers to access areas with field strengths above the OEL to a maximum allowable level of 10 times the OEL when using RF protection suits.

BAI Communications Australia has an overarching EME Management Policy; this policy document is linked to this procedure for managing RF EME Hazards at broadcasting sites under effective management or control.

Please refer to the BAI Communications EME Management Policy in Section 4.2 of this document.

4.1 EME Management Policy

This policy for EME Hazard Management forms part of the BAI group commitment to WHS and covers all work activities performed in environments where EME is present and may exceed the PEL and OEL. This policy applies to all employees, contractors and visitors.

Working in an EME environment is classified as a high risk work activity that requires strict compliance with the following mandatory requirements:

- adherence to all related BAI Communications procedures and work instructions;

- possession of all prescribed minimum qualifications and certifications; and
- satisfaction of any other special requirements as specified from time to time.

All of Broadcast Australia's transmitter sites emit radio frequency (RF) fields. The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) have produced a Radiation Protection Standard: Maximum Exposure Levels to Radiofrequency Fields - 3 kHz to 300GHz. This standard is known as the ARPANSA RPS3 Standard and sets limits for public and occupational exposure to radiofrequency fields, otherwise referred to as Electro-Magnetic Energy (RF EME).

Exposure to RF EME greater than the General Public Reference levels is only permitted under controlled conditions.

The BAI Communications reserves the right, at its sole discretion, to audit contractor qualifications, Safe Work Method Statements (SWMS) and Method of Procedure (MOP) documentation prior to allowing access to sites.

4.2 Precautionary Note

Pre-placement medical assessments are required for occupational exposure to RF Electromagnetic Emissions. Reference to Section 3 of this document is to be considered for employees (prospective or existing), who may be considered for the role of an RF Worker.

5 Managing Risk to Exposure to RF EME

5.1 Overview

This document prescribes processes to ensure that no member of the general public or RF Worker is exposed to RF EME Fields that exceed the applicable ARPANSA RPS3 reference exposure limits.

Exposure to RF Fields greater than the General Public Reference levels is only permitted for RF Workers RF Worker may supervise non RF Workers in areas above the PEL but not above the OEL.

Before any access to elevated RF EME Fields commence, the processes detailed in this document shall be used to ensure compliance with Australian Standards and WHS legislation.

Instructions in Section 4 of this document detail the process for access to sites that does not require any switching of services.

Instructions in Section 5 of this document detail how to compile an outage plan using RF EME Hazard documentation and other data.

Instructions in section 6 of this document detail the process of managing switching or configuration change operations during any work activity at the BAI Communications transmission sites.

5.2 Roles and Responsibilities

The ARPANSA Standard states in section 5.1:

"The following people must ensure that the hazards associated with exposure to RF Fields are managed: employers; owners and operators of RF generating equipment; people in control of workplaces; designers, manufacturers and suppliers of RF generating equipment; self-employed persons."

This statement implies that everyone has a responsibility for safety in the vicinity of RF generating equipment.

BAI Communications Area Managers are responsible to ensure the safety of personnel controlled sites and leased portions of other entity controlled sites.

The person responsible for coordinating the switching of services to protect personnel on a tower or mast (Switching Coordinator) will follow the procedures in Section 6 of this document. They will report any incidences of exposure of personnel to higher than expected RF Fields to the BAI Communications Area Manager.

BAI Communications is responsible for updating the RF Hazard Control Document (RFHCD) for any site that has been modified. If a new RF Hazard measurement survey is required (as deemed by the BAI Communications EME Specialist), this will be prioritised and programmed to be completed.

5.2.1 All Entrants to site are Responsible for

- reporting to the BAI Communications Area Manager any factors that may expose a person to an RF hazard area
- reporting to the BAI Communications Area Manager any changes that have occurred or may occur that would affect the RF levels on a site
- check, confirm and complying with approved Switching Plans or outage plans
- vacating any area with higher than expected RF levels, and reporting to the Switching Coordinator and the BAI Communications Area Manager

5.2.2 BAI Communications EME Specialist is Responsible for

- interpretation of the EME Safety and licensing standard/s applicable
- informing management and staff about changes to the standard
- assessing if sites need re-surveying after modifications
- standardising RF EME information across all sites
- reviewing the qualifications of approved RF workers and surveyors
- managing the site RFHCD creation and subsequent updates
- amalgamating partial re-surveys into the site RFHCD
- completing and archiving Declarations of Conformance (DoC) Licence Condition Determination documents
- performing or reviewing investigations associated with any possible RF over exposure incidents
- analysing site sharing requests on behalf of other business groups for optimal outcomes for new and existing customers
- maintaining working relationships with regulators, standard authors and industry experts
- single point of contact for internal and external RF EME queries
- Reviewing qualifications of RF Workers and Measurement Officers

5.3 Risk Management Process

The BAI Communications uses the following control prioritisations to manage and control risks associated with RF generating equipment. RF Hazard information for controlling access and RF Hazards on site are contained in the site RF Hazard Control Document (RFHCD). Some essential site information can also be found in REMEDY.

5.4 Control Prioritisation

At BAI Communications sites, the RF Fields generated in the vicinity of active antennas often exceed the occupational exposure limit. These hazards are managed through application of the most appropriate control priorities as indicated below. The measures listed higher in the control priorities are given greater consideration than those lower.

The risk of exposure to these fields is minimised by a combination of the following control measures. In order of priority, the control measures are listed in para 5.4.1 to 5.4.6.

5.4.1 Elimination

Elimination of the hazard is not practical. The Broadcast Australia business is based exclusively around the emission of RF Fields. To achieve the coverage required to send a signal to a receiving site often requires the emission of RF Fields at levels in excess of the reference levels specified in the ARPANSA standard.

5.4.2 Substitution

Substitution of the RF Field generating equipment to less hazardous equipment might be an option for communication systems. Microwave links can sometimes be substituted by Fibre-optic cable networks, or satellite receive stations. There is no appropriate substitution for TV and radio broadcasting equipment.

5.4.3 Engineering Control

Engineering Controls include redesign of equipment, processes and/or isolation of the hazard. Examples include RF shielding around equipment, locating antennas higher on structures, use of more efficient antennas, installation of person-resistant fences, fail-safe interlocks and Faraday cage installations surrounding ladders and platforms.

5.4.4 Isolation

Isolation on VHF / UHF sites:

RF Fields emitted from antennas are typically elevated at a substantial height on the structure. RF Fields, exceeding the general-public and occupational exposure limits, are above ground level where access to potential hazard areas is restricted by person resistant fencing, or anti-climb devices.

Structures are inaccessible to members of the general-public by way of access restrictions and signage attached to the structure and fencing that cautions entrants of the existence of an RF Hazard risk.

Isolation on MF and HF sites:

RF Fields are typically emitted from the entire structure/s and associated components. Some RF Fields will be emitted from non-coaxial (open wire) feeders to these systems. RF Fields above public and occupational exposure limits will exist near structures, components and non-coaxial feeders.

The structures have person proof fencing to ensure they are inaccessible to the general public. They have multiple signs attached on all access points, cautioning that there is an RF Hazard risk.

Isolation on all sites:

Where RF Fields exceed the general public exposure limit within 2.5 metres of the ground, appropriate access restrictions are implemented to prevent access by members of the general public.

Note: 2.5m is chosen as a height that the average mass of a human being is unlikely to exceed; including horse riders and children on adult's shoulders.

5.4.5 Administration Controls

Administrative controls such as signage, drawings, RF safe work practices; detailed RFHCD's and outage planning are implemented at BAI. These controls are generally used in combination with the higher level controls indicated above. RFHCD's prescribe safe procedures and drawings for access into areas where RF Fields exceed general public and occupational reference levels.

Only RF workers (typically BAI approved climbers, riggers, experienced technicians and engineers) are permitted on BAI sites unsupervised and these individuals must undertake appropriate risk assessments before entering areas above the General Public restriction limit.

VHF/UHF antennas are attached to the external surfaces of the structure and RF Fields can be directed away from the structure, RF Field levels inside the structures where VHF/UHF antennas are located are often low. Where RF Field levels exceed occupational exposure limits within the accessible parts of the structure, they are recorded in the site RFHCD, and other administrative controls (such as down powering or switching off) are used to control access to these areas.

The site RFHCD must be consulted and followed before access into any RF Field above the general public reference level is permitted. RF workers are to determine from the RFHCD where they can safely work. Copies of these RFHCD's are to be kept on site in the Site Safety Folder, and also on the Baron TX sites intranet web page. The information in the RFHCD *must* be verified that it is current during the outage planning stages and when on site before switching is performed. This is further detailed in section 5 and 6.

5.4.6 Personal Protection Equipment

The last control measure is the use of personal protective equipment (PPE). All users of PPE shall be provided with appropriate training and supervision to ensure they have a clear understanding of its correct usage and limitations.

Leather gloves generally provide good protection against contact current shocks from passively charged and re-radiating structures but are not an adequate protective measure against contact with high power live RF conductors.

RF Protection Suits:

Personal Protective RF suits are available to screen the user from high ambient RF Field exposures. Procedures for the correct use of RF Protection suits are available on the BAI Intranet. All RF suit users must be appropriately trained in the correct use of, maintenance of and inspection of the RF suit.

Refer to the Procedure for Correct use of RF Protection Suit on the HSEQ web portal, link: </HSEQ/Pages/EME.aspx>

RF Monitoring Devices:

Personal Radiation monitors (RADMAN) must be used by at least by one person in a climbing party. BAI Communications typically supplies one RADMAN per person to ensure RF workers can access areas independently of each other. If only one RADMAN is used per climbing group then the lead climber must check levels before other climbers in the group are to climb in that area.

RADMAN or similar personal monitors shall be calibrated every 3 years by a suitably certified calibration organisation. Staff or team leaders issued with these units must ensure that calibration is carried at the specified interval.

RADMAN or similar devices may also undergo a level 2 calibration validation check every 12 months to ensure that the device is fit for use. This is achieved by sending the unit to the BAI Communications calibration lab at Wetheril Park to complete this task and will archive soft copy records of these validations.

The correct operation of RADMAN or similar devices must be confirmed BEFORE and AFTER every use.

Refer to the Procedure for Correct Use of RADMAN Monitoring Device on the HSEQ web portal, link: </HSEQ/Pages/EME.aspx>

6 Training and Supervision

6.1 Medical Assessments

6.1.1 Overview

Metallic implants may concentrate RF heating effect around the object, and international Guidelines (ICNIRP) have advised caution that these implants should be assessed against exposure to the Occupational reference limits for RF Electromagnetic Emission exposure. General Public reference limits are deemed to have sufficient safety margin to preclude the need for assessments.

Various studies on the topic have been conducted worldwide and general "Rules of Thumb" have been devised to offer practical accessible guidelines for making assessments.

Temperature rise is a preferred method for indicating RF heating as opposed to localised Specific Absorption Rate (SAR). The ICNIRP 1998 Guideline to restrict tissue heating due to RF Electromagnetic Emission to a target of less than 1°C in the head and torso applies. At other areas of the body (arms and legs) that are able to tolerate larger temperature increases, a higher target of 2°C applies.

6.1.2 Health Information Questionnaire

Staff or visitors to sites with implanted metal objects or medical devices are to complete the “BAI Communications RF EME Medical Questionnaire Form” regarding implants. Depending on implant type, an assessment may be required by a suitably qualified and experienced (in RF EME Fields) medical professional prior to being permitted to enter any exclusion areas as defined in the ARPANSA RPS No.3 standard.

The results from any examination may preclude RF Worker Qualifications and/or access to sites being granted due to a high risk probability of the implant causing undue heating or suffering from interference from RF Fields.

Refer to the RF EME Medical Questionnaire Form on the HSEQ web portal, link: </HSEQ/Pages/EME.aspx>

6.1.3 Pregnancy

Staff that become aware, or the possibility, of pregnancy (regardless of any Worker Status Qualifications stated in para 6.5, 6.6 and 6.7), are not permitted to access areas that exceed the General Public reference limits as defined in the ARPANSA RPS3 standard. When the pregnancy is postpartum, previous Worker Status may be reinstated if applicable.

Visitors that are aware of, or the possibility, of pregnancy are not permitted to access areas that exceed the General Public limits as defined in the ARPANSA RPS3 standard.

6.1.4 Surgically Implanted Metallic Objects

There are many types of metal implants that are surgically implanted and include;

- screws, rods, wires, plates, pins
- arterial stents
- non surgically implanted objects such as shrapnel and other metallic remnants

6.1.5 Surgically Implanted or Bodily Worn Medical Devices

These implants are typically;

- cardiac pacemakers
- cochlear implants
- all types of dental implants

6.1.6 Externally Worn Metallic Objects

Other types of metallic objects can include;

- Jewellery
- Body piercings
- Spectacles

6.1.7 Rules of Thumb for Assessment

The following implant types do not require a medical assessment;

- Object less than 20mm at its largest dimension
- Object located inside the mouth i.e., tooth fillings, caps, braces and plates
- Object that is round or a wide plate less than 50mm in diameter
- Closed loops or wire loops with ties
- Arterial stents
- Jewellery, worn or body piercings

- Spectacles

For further information for assessments refer the BAI Communications EME Specialist for advice on requirements for specific examples outside of the above listings.

6.2 Training Requirements

The HSEW/HR/BAI EME Specialist groups will designate the appropriate Training Courses required for RF Worker status and or RF Surveyor status.

Staff that successfully complete an appropriate RF Awareness course, will be deemed as "RF Worker" trained and be classed as RF Workers. Initial RF awareness training should be undertaken (where possible) as an instructor lead course. All subsequent courses can be on-line e-learning style courses.

RF Workers shall be trained in safe RF work practices, in the controls in place to manage any potential RF Hazard and understanding when supervision may be required (i.e. areas that have unknown fields and a RF Surveyor may be required to verify RF Hazard levels).

Staff that also successfully complete an appropriate RF Measurement course will be deemed as RF Measurement trained and be classed as RF Surveyors.

Staff that have not completed any of the above training are deemed as non RF Workers and shall be excluded from tasks that involve work in the following areas;

- Areas marked as Restricted
- Areas documented as Restricted
- Areas signed (physical signage) as Restricted
- Areas that have access restriction in place

All of the above areas are deemed as exceeding the General Public limits as defined in the ARPANSA RPS3 standard.

6.3 First In Maintenance (FIM) at BAI Sites

Visitors that are contracted for First In Maintenance activities that are approved to access BAI Communications sites are required to undergo RF Awareness training to access areas above the General Public limits.

6.4 Grounds Maintenance at BAI Sites

Visitors that are contracted for ground maintenance activities that are approved to access BAI Communications sites are required to undergo RF Awareness training to access areas above the General Public limits.

6.5 UAV Operations at BAI Sites

Other visitors such as contracted UAV operators that are approved to access BAI Communications sites are required to undergo RF Awareness training to access areas above the General Public limits.

6.6 Contractors

Other workers or visitors may access sites with RF EME hazards. These will be typically classed as non RF Worker, (i.e. electrical & painting contractors, etc.).

These workers or visitors may not access any area above the General Public reference limit without being either, fully escorted by an RF Worker, or briefed/inducted by an RF Worker on the no-go areas at the worksite.

The RF Worker must take responsibility for the hazard identification on the briefed parties behalf.

6.7 Agistment Site Access

Sites that have Agistment contracts in place that allow approved visitors on BAI Communications sites, the approved agistment visitor/s are required to undergo a thorough induction and are to be escorted/supervised on first visit to be advised of the areas on site that are a No Go zone for this entrant type.

6.8 NON RF Worker Status

Other BAI Communications staff may access sites with RF EME hazards. These will be typically classed as non RF Aware, (i.e. administrative for manned sites).

These workers may not access any area above the General Public reference limit without being either, fully escorted by an RF Worker, or briefed/inducted by an RF Worker on the no-go areas at the worksite.

The RF Worker must take responsibility for the hazard identification on the briefed person's behalf

6.9 Basic RF Worker Status Certification

The following training is required for basic RF Worker status;

- An appropriate ACEBR certified RF EME Safety/Awareness course
- Personal EME Monitor use course

To retain this qualification, this training must be refreshed every three years or sooner if applicable.

6.10 Climbing Staff RF Worker Certification

The following training is required for climbing staff RF Worker status;

- An appropriate ACEBR certified RF EME Awareness course
- Personal EME Monitor use course
- RF Radiation Suit Use & Repair course (only if RF Suits are used for expected works)

To retain this qualification, this training must be refreshed every three years or sooner if applicable.

6.11 RF EME Measurement Officer Status Certification

The following training is required for RF EME Measurement Officer status;

- An appropriate certified RF EME Awareness course
- Personal EME Monitor use course
- RF Radiation Suit Use & Repair course
- RF EME Measurement course

To retain this qualification, this training may be required to be refreshed periodically.

7 Site RF Hazard Documentation

7.1 RF Hazard Control Document (RFHCD)

The RFHCD documents are produced for all BAI Communications owned and managed sites. These documents are archived on the Baron TX Sites web page listed under each site under the EME profile type in the libraries section.

All BAI Communications staff are to follow the work practices and recommendations of the RFHCD. Report and escalate any change in site configuration to the BAI Communications EME Specialist so that a Caution Sheet may be produced and appended to the RFHCD online copy if applicable.

This document must be made available to third entrants to BAI Communications sites.

7.2 How to Interpret RF Hazard control document (RFHCD)

Information contained in the document is mostly self-explanatory, the areas of most interest are the following;

- RF Sources at this site

This section lists the transmitters and antennas on site

- RF Hazard Survey Results

This section lists the results of the survey expressed as a percentage of the applicable standard at various areas at ground level on the site.

- Interpretations of RF Hazard drawings

This section details the RF Hazards on the site/structure depicted in a pictorial view for ease of use.

The above information sources are used to create outage plans when applicable, refer Section 5 of this document.

7.3 Mobile Carrier EME Guide (Revised RCSMB)

BAI Communications has services on non BAI owned sites, if these site owners are affiliated with the Mobile Carriers Forum (MCF), then an EME Guide/RCSMB will be created for the site by the Carrier/Owner whom is controlling the site.

These documents are generally used in the telecommunications industry and as well as certain private and public enterprises (some state government departments etc.).

These documents are archived on an MCF web site known as the RFNSA. BAI Communications has access to these documents when applicable i.e. when Broadcast Services are on the structure.

Some Mobile Carrier EME Guides/RCSMB are incomplete documents and only offer limited information for infrastructure on site. These documents are labelled a "Limited" EME Guide/RCSMB as some information is excluded in the assessment for the document creation.

Access to these documents is by a redirection notice placed on the Baron TX Sites web page listed under each site under the EME title in the documents section.

If an EME Guide or RCSMB exists for a Non BAI owned or managed site and there is no reason to suspect that it is inaccurate, then this EME Guide/RCSMB assessment for the site should be adopted.

A BAI Communications owned, or managed site may also have a current EME Guide/RCSMB for the Telecommunications Carrier antenna systems on the structure. This shall be referred to when undertaking work or access through the areas where infrastructure is installed.

7.4 How to Interpret Mobile Carrier EME Guide (Revised RCSMB)

Information contained in the document is self-explanatory, the areas of most interest are the following;

- Site Contact Details

This section details the site contact details for the infrastructure owners on site

- Site RF EME Drawings

This section details the RF Hazards on the site/structure depicted in a pictorial view for ease of use

- Equipment Installed at This Site

This section lists the equipment (transmitters and antennas) on site

- Safe Work Procedure

This section details the safe working practices for the site

The above information sources are used to organise outage plans when applicable, refer Section 5 of this document.

7.5 If Site Conditions have changed since the last RFHCD was completed

If any site has been modified in a way which would affect the RF Field levels since the last assessment report was completed, then the BAI Communications EME Specialist is to be informed. They will decide using all the available information, for which areas on the site are to be restricted until another RF Field assessment is completed.

If the existing RF Hazard Report is inaccurate then the RF Hazard Report shall be supplemented with a form titled EME Caution Sheet that details any inaccuracies encountered in the report and is used to manage the site RF Hazards.

The BAI Communications EME Caution Sheet can be obtained on the HSEQ web page, link: </HSEQ/Pages/EME.aspx>

7.6 When Changes to the site conditions are planned

If work activity is planned, any queries may be escalated to the BAI Communications EME Specialist for consultation regarding the safe working practices for access on the site when the BAI Communications Area Manager is evaluating the switching plan (including any Master Service Effects Plan). The BAI EME Specialist may decide, with consultation with the BAI Regional manager, if proposed changes to a site requires a reassessment of the RF EME Hazards.

7.7 Doubts about an existing site RF Hazard Report

If there is any reason to suspect inaccuracies in any RFHCD or EME Guide/RCSMB, then the BAI Communications EME Specialist is to be informed. They will decide, using all the available information, which areas on the site need to be restricted until another RFHCD or RCSMB is completed.

If the existing RF Hazard Report is inaccurate then the RF Hazard Report shall be supplemented with a form titled BAI EME Caution Sheet that details any inaccuracies encountered in the report and is used to manage the on site RF Hazards.

The BAI EME Caution Sheet can be obtained on the HSEQ web page, link: </HSEQ/Pages/EME.aspx>

7.8 When there is no RF Hazard report available for a site

Where no RF Hazard report exists, either in the form of an RFHCD or an RCSMB, then the BAI Communications Area Manager must ensure that this issue is escalated to the BAI Communications EME specialist. An RF survey will be commissioned for the site if the BAI Communications EME Specialist deems it necessary. The following procedures shall be followed for interim access to the site:

- No VHF/UHF site structure is to be climbed unless an approved RF Surveyor is on site to measure the areas to be accessed or approval is given by the BAI Communications EME Specialist after assessment of the request.
- No AM/HF structure is to be climbed with the site operating (even if operating on alternate/standby antenna) unless an authorised RF Surveyor is on site to measure the areas to be accessed or approval is given by the BAI Communications EME Specialist after assessment of the request.

A BAI EME Caution Sheet shall be placed in the front of the electronic master copy of the RFHCD until it has been updated to reflect the issues on site.

The BAI EME Caution Sheet can be obtained on the HSEQ web page, link: </HSEQ/Pages/EME.aspx>

8 Compilation of an Outage Plan

8.1 Outage Plan Training Requirements

Staff that are required to create outage plans in their normal business duties must be guided by a technical person who has knowledge and is experienced in producing outage planning tasks.

Queries can be raised to the BAI Communications EME Specialist for me detailed analysis of technical detail when required.

8.2 Compilation of an Outage Plan

Outage plans are compiled by combining information from various sources of information such as, the RFHCD, REMEDY/EAMS and Baron TX Sites or information from the Area Manager. The primary information source is the RFHCD, even if this document is considered current this information must be validated from data held in REMEDY/EAMS and Baron TX Sites or from the Service Integrity Unit Area Manager.

The preparation of outage plans to allow staff to access areas that are above the Occupational restriction limits must be undertaken only by individuals who have completed an approved RF Awareness training course.

Outage requests and detailed requirements must be confirmed within Remedy and the outage request and on site prior to the event to ensure that services and configurations on site match the request.

8.3 Outage Plan Template

The current outage plan document Outage Planning Request Form (OPS3008-FA) is to be used for creating Outage Plans, refer document listings in the References section of this document.

The outage template has instructions associated for data that is required to be entered into the form.

8.4 Outage Planning with the Area Manager

The Area Manager must be engaged when determining outage plans for review and approval.

The Area Manager may escalate any queries on issues to the BAI EME Specialist for clarification or validation.

8.5 RFHCD Data

The RFHCD is the primary source of information to compile an outage plan, the most current RFHCD can be obtained from the link: <http://txsites/default.aspx>

The RFHCD contains information of the transmitters, antennas and site measurement data that is used to determine transmission power reductions for services to reduce the EME levels at areas on sites/structures.

8.5.1 RFHCD Section for RF Sources on Site

This section details the antenna types, array descriptions and orientations as well as the service names and transmission power (checked on site) that were assessed at time of RF survey.

The Broadcast Service data is duplicated on the RF Hazard drawings in the document and is located in the Services Table for both Station Normal and any Reduced Power drawings if applicable.

Even if this information is suspected to be current it should still be validated against service data in Remedy i.e. services, antenna types, transmission power.

8.5.2 RFHCD Section for RF Survey Results

This data details the results for the general areas on site, they are expressed as a percentage of the ARPANSA RPS3 Standard that apply for the frequencies in use at this site.

These results may be useful when compiling outage plans and are recommended to be reviewed to foresee impacts to access in certain areas either within the site grounds, buildings or enclosures and the structure/s present.

8.5.3 RFHCD Section for RF Safety Procedures for this Site

This section is the most important area of the RFHCD as it contains detailed information for transmission power reduction for each service that is to be applied when accessing areas on the site.

If this information is suspected not to be current, then these services, antenna types, transmission power must be validated against service data in REMEDY. Additional or decommissioned services must be taken into account, with the appropriate increases or decreases in transmission power.

8.5.4 RFHCD Section for Interpretations of RF Hazard Drawings

The RF Hazard drawings in the document formulate a graphical depiction of the exclusion areas on site.

The drawings contain:

- Plan and elevation view of structure/s
- Exclusion areas for various levels of RF Fields
- RF survey results for RF Fields at points of interest
- Broadcast Services table detailing transmission power & channel data
- Legend indicating various RF Field levels
- Minimum and maximum RF Field levels for ladders and platforms only

All of the above information is reviewed and used in determining any power reductions if applicable for the site.

If additional or decommissioning of services has taken place after RF Survey measurement levels were taken, then the additional services must be taken into account and with the documented RF Field levels can be used to extrapolate the RF Field variance.

8.6 Remedy Data

Remedy is used to determine the current services that are active on site, this data is validated against the RFHCD service data that was assessed.

Various information resides under tabs in the database, these tabs contain specific information for the infrastructure that operates active services.

8.6.1 Service Information

8.6.1.1 Service Information Tab

This tab contains the service information such as, service name, code, type, call sign, ID, operating frequency and client. It is validated against the RFHCD service data to ensure that the current services operating have been assessed.

8.6.1.2 Transmitter Information Tab

This tab contains the transmitter information such as, type, operating transmission power and maximum transmitter power. It is validated against the RFHCD service data to ensure that the current services operating have been assessed.

8.6.1.3 Antenna and Combiner Information Tab

This tab contains the antenna information such as, type, radiating pattern, polarisation, standby status, configuration, gain and height. It is validated against the RFHCD sources on site data to ensure that the current services configurations operating have been assessed.

8.6.1.4 Essential Site Information

This section may contain additional hazard information that can be used in the compilation of outage plans. They may not necessarily be RF related but may need to be reviewed to ensure that outage plans do not inherently create additional risks or hazards.

8.7 Baron TX Site Data

The data that resides in Baron contains sections for structure drawings, antenna and feeder listings.

8.7.1 Drawing data

All drawings for the site are listed in this section, these drawings range from RF schematics to structure and site drawings. The structure drawings (specifically the General Arrangement tower drawings) are used as the basis for the RF Hazard drawings in the RFHCD and contain antenna type, orientation and height information.

8.7.2 Antenna and Feeder Data

Antenna & feeder Information is available on the Baron TX Site web page, its current form is in spread sheet format and it lists all antennas and any proposed changes to antennas on site. This information should be validated against the RFHCD antenna data to ensure that the current antennas operating have been assessed.

9 Suspected Over Exposure to RF Electromagnetic Emission

If an incident occurs and it is suspected to be an RF EME over exposure, please refer to the HSEW intranet page for process guidance from the link below;

<http://intranet/HSEQ/Pages/EME.aspx>

10 Related Documents

10.1 Internal Documents

Document Number	Document Title
HSEQ-TEM-0008	EME Caution Sheet
HSEQ-PRD-3054	Procedure for Correct Use of RADMAN Monitoring Device
HSEQ-PRD-3056	Procedure for Correct Use of RF Protection Suit
HSEQ-PRD-0001	Procedure for RF System Operation - Reconfiguration
HSEQ-WI-3054	Work Instruction for Raising EME Issues in Remedy
HSEQ-TEM-0009	EME Suspected over Exposure Investigation Form
HSEQ-TEM-0007	RF Hazard Temporary Management
HSEQ-TEM-0010	Unexpected EME Monitor Alarm Form
HSEQ-TEM-0011	RF EME Medical Questionnaire Form
HSEQ-WI-3029	BAI Group Safety Warning and Lockout
TBC	Site Access Protocol
OPS3003	Site Management
OPS3008	Planned Outages
OPS3008-FA	Planned Outage Request Form
OPS3010	Site Access Management

10.2 Compliance Requirements

Applicable	Document Title
ARPANSA	ARPANSA Radiation Protection Standard Number 3 Maximum Exposure Levels to Radiofrequency Fields 3kHz to 300 GHz
ICNIRP	Guidelines for limiting exposure to time varying electric, magnetic and electromagnetic fields up to 300GHz (ICNIRP 1998)
ACMA	ACMA License Conditions Determination 2015

11 Document Control

11.1 Approval

The following table lists personnel who are responsible for authorising the document:

	Title	Name	Signature	Date
Owner	Antenna & Structures	Grant Shapcott	<i>Maintained on file</i>	
Approver	GM HSEQ	Nick Watts	<i>Maintained on file</i>	

11.2 Document History

The following table lists the changes made to this document:

Version	Date	Amended by	Comments
D1.0	2014	Lincoln O'Grady	Document Not Released
R2	25/10/2014	Lincoln O'Grady	Document Released
D3.5	28/08/2019	Lincoln O'Grady	Document Periodic review
V4.0	08/11/2019	Lincoln O'Grady	Version for release