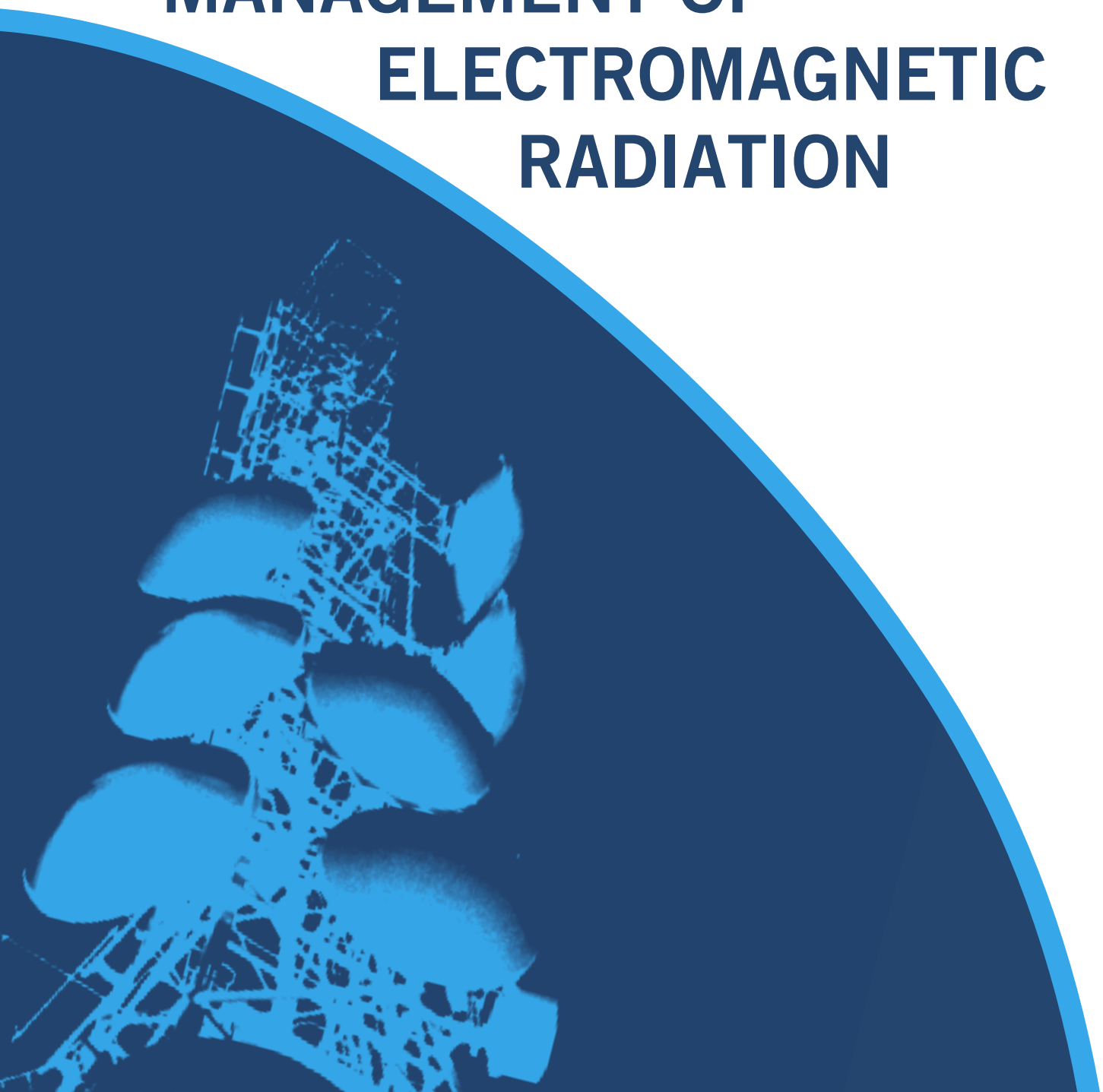
SITE
MANAGEMENT
ALLIANCE

MANAGEMENT OF ELECTROMAGNETIC RADIATION



BACKGROUND TO EMR

Radiocommunications is made possible by electromagnetic radiation (EMR) from transmitters. EMR is emitted in all directions from a transmitter, and will pass through some materials. When a new transmitter is added to a group of transmitters it increases the previous overall EMR level – EMR levels are cumulative. If EMR levels are sufficiently high, they can cause physical damage.

Exposure to EMR levels can be controlled by, for example:

(a) changes to the operating parameters of transmitters
(b) physical barriers
(c) appropriate access procedures
(d) training of persons who may be exposed to RF radiation

Variations in EMR levels:

(a) may result from:
  (i) addition of transmitters to a site
  (ii) changes to the operating parameters of transmitters
  (iii) the alteration or construction of structures through re-radiation or reflection
(b) may change the areas at a site at which access must be controlled or prohibited

There are two ways to assess EMR levels:

(a) measurement of actual levels
  (i) this gives only a 'snapshot' of EMR levels at a particular time; and
(b) engineering modelling of properly acquired data
  (ii) this approach is far more cost effective than routine measurement, and allows for low cost updating

THE REGULATORY CHANGES

In May 2002 the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) published a new standard for maximum exposure levels to radiofrequency fields.

(a) The standard sets maximum levels for exposure for occupational and non-occupational exposure.
(b) Previously there was no standardised methodology for measuring cumulative EMR.

On 10 October 2002, the ACA registered the Deployment of Radiocommunications Infrastructure Code under Part 6 of the Telecommunications Act 1997.

The Code:

(a) only applies to infrastructure installed by carriers
(b) is predominantly concerned with consultation with local government and the general public on the installation of infrastructure
(c) does not address the issue of cumulative levels of EMR from all transmitters at sites
(d) essentially applies to only 4 carriers

On 1 March 2003 the Australian Communications Authority (ACA) imposed a licence condition on approximately 12500 radiocommunications licensees.

(a) Licensees must individually comply with the ARPANSA levels.
(b) Cumulative levels do not have to be met, because the ACA could not establish a coherent compliance regime, though the ACA has indicated recently that it may legislate for cumulative levels.
(c) The licence conditions are essentially irrelevant to occupational health and safety.
(d) The fact that the licensees at a site individually comply with the ARPANSA standard does not mean that the site complies as a whole.

The Regulatory Changes:

On 29 July 2004, the Australian Health Minister's Conference agreed that compliance with the ARPANSA Standard should be made compulsory by legislation of the Commonwealth, and of each State and Territory.

Compliance with the ARPANSA standard requires, as a minimum:

(a) determination of the areas where non-occupational exposure levels may be exceeded
(b) determination of the areas where no access should be permitted
(c) appropriate restrictions on access to both areas
(d) appropriate provision of signs or notices complying with AS 1319 (Standards Australia 1994)
(e) notification to the relevant competent authority, as required, in the event of the exposure exceeding the relevant limits
(f) minimising, as appropriate, RF exposure which is unnecessary or incidental to achievement of service objectives or process requirements

Where there is more than one radiocommunications operator at a site, none of these objectives can be achieved by an individual operator on its own.

(a) The cooperation of all licensees and the property owner is required.
(b) This allows for cost sharing.
(c) There are synergies between EMR compliance and radiocommunications licensing requirements that can deliver cost savings to radiocommunications licensees, and so encourage participation.

THE LEGAL IMPACT

Existing Occupational Health and Safety legislation and the ARPANSA Standard have already effectively imposed a duty of care to meet cumulative levels of EMR on:

(a) property owners/managers; and
(b) employers, including radiocommunications licensees, whose employees enter areas subject to EMR

When the legislation foreshadowed by the Australian Health Ministers' Conference is introduced in every State and Territory, the owners and managers of property with communications devices, and the operators of those devices, will be specifically compelled to join together to comply with the requirements of the ARPANSA Standard.

To meet the duty of care, and achieve compliance with the ARPANSA Standard:

(a) transmitters actually present at a site must be identified
  (i) owners have no idea what is on their rooftop
  (ii) the ACA database cannot be relied on - it may record transmitters that are not present
  (iii) the only option is actual inspection

(b) data on the electrical and other characteristics of transmitters must be acquired by appropriately qualified staff

(c) the owner must make information available on the dimensions, topography, and uses of the site

(d) the combined information must be assessed, modelled, and if necessary verified by measurement to determine EMR levels

(e) radiocommunications licensees must update the initial data to reflect changes to transmitter characteristics as they occur

(f) proposed installations and construction work must be assessed for their impact on the occupational health and safety regime so that problems are identified and addressed before they occur

(g) all relevant changes must be continually assessed for their impact on continuing compliance, and appropriate action taken

The SMA service also provides a single integrated process for hazard markings to ensure that the site is correctly marked out in relation to all antennas on the site, signage is also coordinated so that occupants of the site can access with confidence that they are operating in a properly documented and signposted work environment.

THE PRACTICAL PROBLEM

Measuring actual levels at single transmitter sites could be unnecessary, and prohibitively expensive. However, it is possible to conservatively model EMR levels in most cases at such sites.

EMR levels may increase with changes to the operating parameters of transmitters, and will necessarily increase when a new transmitter is added.

(a) New structures will generally alter the EMR levels at points at a building.

(b) Even substitution of an existing structure may vary or increase EMR levels.

Where changes occur:

(a) measurements taken at any point in time will become meaningless
(b) radiocommunications licensees cannot assume that they continue to comply

Where levels are exceeded, resolution of the problem cannot be left to negotiation between multiple licensees at a site.

(a) The property owner cannot 'delegate' its duty of care, and must take action to avoid potential liability.
(b) Failure to act may effectively leave the decision in the hands of the most powerful, but not necessarily the most lucrative licensee.

THE SOLUTION

The Site Management Alliance (SMA) is a group of expert small and medium enterprises, combining skills to deliver excellence in the management of EMR at rooftops and other sites to industry stakeholders including the broadcast industry, property owners and all radiocommunications licensees. The SMA is offering a comprehensive EMR management system that provides for:

(a) acquisition of initial information by appropriately qualified persons
(b) modelling of information by a NATA accredited body , and measurement of actual levels where necessary by a NATA accredited body.
(c) production of:
    (i) EMR hazard diagrams showing areas requiring access restrictions
    (ii) photographic survey of the premises
    (iii) site specific occupational health and safety strategy
(d) design and installation of all necessary signage
(e) ARPANSA format report on cumulative EMR levels
(f) Site Radiation Folders
(g) online upgrade of all EMR details and automatic revision by NATA accredited body of:
    (i) EMR hazard diagrams
    (ii) site specific occupational health and safety strategy
    (iii) signage
    (iv) ARPANSA format report for public access
    (v) Site Radiation Folders
(h) online access by property owners to all information acquired concerning their properties
(i) a historical record of site changes for occupational health and safety and public exposure purposes
(j) online access by radiocommunications licensees to the information on their own equipment

Standard contracts required to support the information flows between the property owner, radiocommunications licensees and the SMA, are provided as part of the SMA package.

If radiocommunications licensees wish to do so, they can take advantage of the SMA system to simultaneously achieve compliance with the ACA's licence conditions, and elements of the ACIF Deployment of Radiocommunications Infrastructure Code.

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