EXPOSURE DRAFT
Part 1 & 2

Wireless Institute of Australia response to the

Australian Communications & Media Authority ACMA Consultation 31/2022:

“Proposed amateur class licence and considerations for higher power operation”

Contents

1.0 Executive Summary

The Wireless Institute of Australia (WIA) thanks the ACMA for the opportunity to provide feedback on its public consultation No. 31/2022 “Proposed amateur class licence and considerations for higher power operation” regarding the migration of non-assigned amateur radio licences from the apparatus to the class licensing framework and the potential introduction of new higher transmitter power privileges.

The WIA welcomes and endorses the proposed changes subject to a number of outstanding issues (mostly operational in nature) being resolved.

The WIA also welcomes the inclusion in the new draft class licence of improved spectrum access for amateur AOCP(S) qualified licensees to the 50-52MHz band - and in particular the offer of providing an early introduction of this privilege.

The WIA is also pleased to see the ACMA start the process of determining new arrangements to support access by amateur service AOCP(A) qualified licensees to higher power privileges. However, the WIA’s views on how to best proceed differ significantly from the ACMA. The WIA is concerned that the higher power proposals, as presented, would be unworkable in practice and restrict operations for a service that by its nature can be fluid in configuration.

The regulatory hurdles and compliance costs associated with the proposed approach to introducing higher power would act as a significant barrier to the implementation of higher power privileges by AOCP(A) qualified operators. The result is that high power operation would not be available to many of those who could safely benefit from the change.

Instead, the WIA proposes an alternative solution to how higher power privileges can be safely introduced. In doing so the WIA has focused on the practical actions that can be taken to ensure compliance with the ARPANSA electromagnetic emissions standards as well as mitigating EMI and radiocommunications interference concerns.

A key interest of the WIA is that the changes reinforce the fundamental aspects of the amateur radio service that make it unique and valuable. Supporting the non-commercial and highly experimental nature of the amateur service is essential for the service to flourish and effectively contribute to STEM capability in the broader community along with communications in natural disaster or emergency situations.

2.0 Introduction

The WIA welcomes the opportunity once more to provide feedback on the ACMA proposals to revise the regulatory arrangements that support the amateur radio service in Australia. We are very pleased to see ACMA take on board many of the items the WIA provided feedback on in the previous 2021/01 ACMA consultation on this issue, and are grateful for the opportunities provided by ACMA for dialogue over the past 18 months in developing solutions to many of the problems identified by our members.

The WIA is also pleased to see that the ACMA has commenced the process to reconsider the transmitter higher power privileges arrangements for the amateur service in Australia, but notes that there is a substantial difference of opinion as to how to achieve a workable outcome.

It is our intent to present this response to the ACMA consultation in two parts.

- First, to address the amateur class licence proposals
- Second, to provide feedback on the proposed introduction of higher transmitter power privileges for the AOCP(A) class amateur radio operators in Australia.

The WIA feels it is important to tackle each issue with a degree of separation, as the work to migrate to the class licence is now well advanced and is looking positive, while the work on the higher power privileges has much further to go and is much earlier in its development. That is why the WIA response has been presented as two papers - Part A tackling the class licence migration and Part B tackling higher power privileges.

2.1 Introducing the Amateur Service

Amateur radio is a science-based technical activity enjoyed by over three million people worldwide. It is a recognised radiocommunications service by the International Telecommunication Union (ITU) and is listed in the ITU Radio Regulations as the ‘amateur service’ and the ‘amateur-satellite service’.

Most importantly, unlike most other radiocommunications services, operators in the amateur radio service must demonstrate technical competence to use amateur radio equipment. This is done through the requirement to obtain a relevant technical qualification through an examination process where all aspects of technical and regulatory knowledge required to construct and safely operate radiocommunications transmitters are assessed. This key point fundamentally sets the amateur service apart from most other radiocommunications services, a point which appears to not be well understood by ACMA in light of some of the regulatory proposals made in the consultation.

- The amateur service is a radiocommunication service:
    - for the purpose of self-training,
    - Intercommunication and technical investigations carried out by duly authorised amateurs,
    - persons interested in radio technique solely with a personal aim and without pecuniary interest.
- And the amateur-satellite service is:
    - A radiocommunication service using space stations and earth satellites for the same purposes as those of the amateur service.
- More information about the amateur service can be found in Appendix I.

2.2 Amateur service operators are universally technically qualified

The WIA finds that, from time to time, some of the proposals by ACMA to manage the amateur service have been drawn directly from current commercial practices that do not always align with the fundamental nature of the amateur service. The commercial domain operates with the explicit assumption that the operators of fixed, mobile, satellite, broadcast and other transmitting stations may not be trained, and therefore the regulations need to ensure safety overtly. However, the WIA contends that some of these approaches fail to recognise that the amateur service is universally technically qualified, where all operators have to demonstrate competence. The WIA believes that this perspective drives ACMA approaches to equipment standards, ownership, and electromagnetic emission (EME) management, that do not deliver the best outcomes for the amateur service.

At the same time, the WIA also acknowledges that the amateur service itself has some way to go in improving the understanding and education on certain aspects of the radiocommunications regulatory landscape, EME in particular. The WIA feels a collaborative education based approach would be important and that is presented in this response.

2.3 ACMA proposals must recognise the unique nature of the Amateur Service.

The WIA is concerned that some of the new or modified requirements, and some of the ways areas are proposed to be managed, do not recognise the variable and experimental nature of the amateur service. The amateur service's core values are its flexibility, breadth, and experimental nature. Amateur stations are frequently changed, relocated and reconfigured, and can be operated across a very diverse range of frequency bands, emission types, powers, and operating techniques and purposes. It is the ultimate citizen science learning and training environment and offers (when recognised) considerable value to the Australian community.

Any regulatory approaches intended to manage amateur radio activities need to be based on a clear understanding that the amateur service is not a set of fixed "install once and just talk" stations. The WIA encourages the ACMA in considering changes to the amateur service regulatory framework, to always test their proposals against this fundamental tennant and to critically consider if alternative approaches might better support rather than diminish this unique aspect of the amateur service.

In the WIA response, we will outline the areas of concern, and offer recommended solutions to ACMA.

PART 1

CLASS LICENCE INTRODUCTION

3.0 Class Licensing Arrangements & Other Matters

3.1 Qualified support for conversion to a Class Licence

The ACMA in this consultation, and in the attached revised draft amateur radio class licence, has elected to continue with its preferred direction as outlined in the first consultation paper 2021/01 .

The WIA originally opposed the class licence as presented in that paper, as there were multiple significant negative impacts identified to the amateur service. However, at that time, the WIA also indicated that if the ACMA were to address the issues identified, then the WIA would reconsider its position.

Subsequently, the WIA has welcomed the opportunity to have multiple meetings with ACMA, leading to the satisfactory resolution of many of the original issues identified.

Today, the WIA believes that the revised draft class licence is something much more amenable to the amateur service. The proposed operational practices and policy documents intended to operate alongside the draft class licence offer further support, addressing many of the residual concerns previously identified. Therefore, subject to the outstanding matters below being successfully resolved, the WIA would be willing to endorse the class licence proposal made by ACMA.

WIA Policy:

The WIA would endorse the migration of the existing amateur apparatus licence (LCD) arrangements for non-assigned amateur radio licensees to the new proposed amateur class licence (LCD) instrument on condition that:

- *A public register is created and maintained that at a minimum contains:*
    - *issued callsigns,*
    - *associated qualifications and*
    - *renewal dates*

  This must be mandated by ACMA as something to be provided by the 'call sign entity' defined for the purpose of managing the issue of callsigns.

- *The additional "EME low Risk stations" proposals are adopted into the amateur class licence LCD*

- *ACMA commit to providing suitable individually tailored documents on request that can support of Australian amateur radio operators accessing town planning services and Australian amateurs seeking access to reciprocal licensing in overseas countries*

- *Callsign allocation limits are imposed (in alignment with those in New Zealand)*

- *The WIA additional proposed arrangements for "clubs" be adopted by ACMA*

The remaining matters are more technical in nature and should also be able to be addressed by ACMA in a final proposed instrument, as well as in policy statements around the future management of the amateur service. The WIA commends the following proposals to ACMA for consideration as part of the final implementation of the Australian amateur class licence arrangements.

3.2 EME Regulatory Arrangements

The WIA is pleased that the ACMA has noted the concerns raised in the original 2021/1 consultation about solely referring to the ARPANSA standard as the means of achieving EME compliance within the amateur service. In particular, the WIA believes the restoration of the tiered system previously outlined in the “Apparatus Licence LCD” is a positive step.

However, the WIA recommends ACMA consider the following further improvements.

3.2.1 Schedule 1 Section 2 - conditions

The WIA believes there is an inconsistency between the ACMA requirements in Schedule 1 Section 2 (2) of the draft amateur radio class licence and the ARPANSA Standard RPS-S1 that will lead to confusion within the amateur service. The ACMA requirements do not align with the content of RPS-S1.

To remove the risk of confusion by amateur radio operators undertaking the required EME self-assessments, the WIA proposes the ACMA replace Schedule 1 Section 2(2) with a reference to ARPANSA RPS-S1 Section 2, stating that for amateur service operations the general public limits are to be applied.

The ARPANSA standard indicates the measurements to be considered (E-field, H-field, or Incident power density) per frequency range in Tables 4 - 8 for each relevant circumstance, and hence duplication by ACMA in the licence appears unnecesary.

The Opportunity: update references to measurement methodologies in alignment with ARPANSA standard RPS-S1.

Recommendation 1: schedule 1 part 2 “Condition – compliance with electromagnetic energy standard” (2) “Measuring compliance with the condition” be replaced with a reference to ARPANSA RPS-S1 Section 2, stating that the relevant required measurements for a given frequency band shall be as per the general public limits defined in table 4 - 8.

3.2.2 Schedule 1 Section 3 - low risk stations

The understood intent of this section is to enable an EME self assessment to be undertaken by the amateur operator unless directed to undertake a full assessment by ACMA. Currently, this applies in the following circumstances:

Extract from Schedule 1 Part 3 of the draft class licence:

Either:

A. *The station operates such that:*
   a. *The average total power supplied by the station to all antennas is not more than 100 watts;*
   b. *The antennas are installed so that they are inaccessible to a member of the general public.*

Or:

B. *The station is configured such that:*
   a. *the base of the antenna is at least 10 metres above ground level.*
   b. *the average total EIRP of all antennas fed by the station is not more than 3200 watts EIRP in any direction.*

Or:

C. *The station is a mobile station:*
   a. *where the average total power supplied by the station to all antennas is not more than 100 watts.*

The WIA believes that the current “low Risk Stations” definition is excluding some types of operation which, noting the limits defined for other existing activities, should also be considered “low risk” activities. In considering this aspect, the WIA has taken into account the technical qualifications of the amateur service, and the safety awareness amateur radio operators have when operating transmitters.

The following table sets out many typical amateur activities (columns 1 & 2), and the WIAs understanding of whether they are covered by the current low risk stations definition (column 3) , or not. It also contains an assessment of how that activity could in practice be considered low risk, but for which the current regulations deem otherwise (columns 4 & 5):

Activity	Station Details	Complies with “Low Risk” Today	How could this activity be considered “Low Risk”?	Should be included in the “low risk” category
HF station operating at home	14-30MHz directional antenna atop a 10m structure with antenna gain less than 9dBi operating at 400W PEP <35dBW EIRP average power	Yes	Antenna >10m high and below 35dBW (3200W) average EIRP limit.	Yes

Activity	Station Details	Complies with "Low Risk" Today	How could this activity be considered "Low Risk"?	Should be included in the "low risk" category
HF station operating at home (backyard private property, controlled access environment ⇒ no public access)	1-30MHz vertical antenna at ground/roof level	Yes	<100W in an enclosed private back yard with no public access (requires locked gates)	Yes
HF portable station operating in public spaces - operator in visual sight of the antenna and its surrounding environment whenever transmitter is activated (eg operating in a recreation / nature park)	Inverted V or vertical antenna installed below 10m. Station operating <=100W	No	The additional consideration that the antenna environment is under visual observation by an "aware user" (as defined in ARPANSA RPS S-1 (Rev. 1)) means the transmissions (which are intermittent anyway) can be stopped when a member of the general public approaches the station	Yes
Mobile Station	A mobile station operating using less than 100W	Yes	Existing Mobile limits	Yes
VHF/UHF home station - low gain (<6dBi) Vertical polarised Omni <100W	Antenna mounted more than 4m above any human accessible area	Yes	<100W in an enclosed private back yard with no public access (requires locked gates)	Yes
VHF/UHF Satellite communications in a public portable environment	Low power (<5W) from hand held equipment using hand held 4-8el yagi antennas <10dBi gain (typical amateur portable station satellite tracking and communications).	No	Consider that such operation is conducted by an RF "aware user" who can cease transmission if an unqualified person approaches	Yes

Activity	Station Details	Complies with "Low Risk" Today	How could this activity be considered "Low Risk"?	Should be included in the "low risk" category
VHF/UHF Home Satellite station	High gain (<15dBi) directional antennas with EIRP <100W (satellite transponder overload limit) communicating with space objects but antennas are only 5-7m above ground. (typical amateur fixed station satellite tracking and communications).	Yes	Inside a private yard and EIRP below 100W	Yes
UHF/SHF Satellite Communications	60-90cm dish and 10W PEP on 2.4GHz near ground mounted (eg Geostationary future satellite comms) (2W average over 6 minutes, 26dBi gain, equiv 800W EIRP)	Yes	Inside a private yard or a fenced exclusion zone of a suitable x metres diameter - "aware user" can establish such a control and make this inherently safe	Yes
Stationary portable VHF/UHF station - eg used in a field day or emergency communications or communications training exercise	<50W and omni-directional antennas <6dBi gain on portable towers where the base of the antenna is >5m and no human access is possible in the plane of the antenna for 10m from the station	No	Field calculation and measurement both show such a configuration will always meet the public exposure threshold of RPS-S1. This type of activity should therefore be added to the exemption description	Yes

The WIA believes that recognition of the actual level of risk of amateur activities, (taking into account the revisions contained in ARPANSA standard RPS-S1 and the fact that amateur operators are technically trained), could be achieved with the additional clause below.

The Opportunity:

Recommendation 1: schedule 1 part 3 “Presumptions about compliance with the condition in subclause 2(1) – low risk stations” be amended to include additional criteria defining low risk stations as follows:

“Or:

D. The station antennas and the immediate environment are visible at all times by the operator of the transmitter and; the transmitter power output is <100W below 30MHz or <10W above 30MHz and; the antenna gain is <10dBi between 30MHz and 1GHz and; the operator, as an “aware user”, shall cease transmissions should any person approach the station antenna radiating element within a distance of 5m.

3.2.3 Schedule 1 - writing style

In keeping with the broader Australian community, the Australian amateur population is culturally and linguistically diverse. The WIA wishes to point out that the proposed draft LCD instrument, while necessarily written from a legal perspective, contains wording that is delivered with a level of complexity that many in the target audience will likely find confusing. This is clearly opposed to the objective the ACMA is seeking, namely compliance by the amateur service with current EME safety regulations.

The WIA believes that this will have an adverse effect on compliance.

Recommendation:

The ACMA needs to reconsider the language and writing style used in this document and work to improve its readability. It needs to be framed in a way that enhances understanding by the target “technical” rather than the “legal” audience.

Failure to do so will likely result in significant levels of unintended non-compliance, particularly among communities where English is a second language.

3.3 Reciprocal Arrangements for Overseas Amateurs Visiting Australia

3.3.1 Short term visitor arrangements

The proposed arrangements, where the current Overseas Amateur Radio Class Licence is to be combined with the new proposed Amateur Radio Class Licence, are supported by the WIA. The WIA believes the new arrangements will reduce ACMA administrative overheads and clarify the situation for visiting amateurs.

In addition, the WIA supports the extension of the short term licence period from 90 to 365 days.

3.3.2 Long term recognition of overseas amateur qualifications

The WIA is concerned by the changes made to the overseas qualification recognition policy on the 19th of September 2020. In particular, the WIA believes the changes to enable permanent transfer of licences undermines the original intent of amateur radio reciprocal licensing arrangements.

The WIA argues that the purpose of reciprocal licensing was not just to facilitate operation in Australia by persons who obtained their qualifications overseas, but also to enable their qualification to be transferred and be recognised without further examination, at least in regards to the technical component. This is much like the situation with, for example, a car drivers licence, which can typically be transferred without having to repeat a driving test.

The WIA believes the changes steer the reciprocal licensing process for amateur radio in Australia away from the original “recognised prior learning model”, which had the intent of simply recognising equivalent overseas qualifications, to a model where qualified people have to “re-establish” their technical qualifications. This model, currently conducted via the AMC through a very unorthodox oral examination approach, and at considerable expense to the applicant, is without precedent elsewhere in the world. It has failed to recognise the international bi-lateral agreements in place as listed on the ACMA website.

It is also acknowledged that there are concerns within the Australian amateur community regarding Australian residents using the reciprocal licensing framework to seek and obtain overseas qualifications, and then to use those qualifications to obtain an Australian amateur radio licence. The WIA understands that this was the principal driver behind the change in approach to reciprocal licensing, but it has resulted in an inequitable situation for genuine international migrants.

The WIA wishes to propose an alternative solution for consideration by ACMA:

The Opportunity: restore the original intent of reciprocal licensing by:

Recommendation 1:

a.) Remove the “recognised prior learning” technical oral examination requirements to access an equivalent Australian AOCP(A), AOCP(S) or AOCP(F) qualification for overseas amateurs who obtained their qualifications by sitting examinations in a country recognised on the reciprocal arrangements table on the ACMA website

b.) Formally declare that when applying for a reciprocal licence that the only additional examination requirement required to obtain an Australian qualification is to sit and pass an Australian amateur radio regulations exam.

Notwithstanding these recommendations, the WIA supports grand-fathering of amateur licences issued prior to 19th September 2020 obtained through reciprocal licensing which were not subject to limits on licence term or renewal.

However, in those cases, the WIA believes the class licence arrangements present two difficulties and we request further information:

Request for feedback:

1. The WIA seeks to understand what documentation will be provided to Australian amateur radio licence holders who have been granted a licence on the basis of their overseas amateur radio qualifications before 19th September 2020, for establishing their rights to access the amateur radio class licence once apparatus licensing is discontinued. (The WIA believes documentation is necessary to establish their rights to an amateur radio class licence, noting that they do not hold an AOCP(A), AOCP(S) or AOCP(F) certificate of proficiency and will no longer receive an individual amateur apparatus licence).

2. The WIA also seeks to understand what new form of documentation would be provided to radio amateurs who choose to operate under the domestic rather than visiting overseas amateur provisions of the new class licence, by transferring their technical qualifications and sitting an Australian regulations exam. In this case, will they be awarded an Australian AOCP certificate with annotations as to where the theory component qualification is sourced, or is another mechanism being considered by ACMA?

3.4 Application of Radiocommunications Standards to Amateur Equipment

The WIA remains concerned that the possession and operation of transmitters by amateur radio operators, given the experimental nature of the amateur service, is not adequately covered. As the class licence is currently silent on the matter, rather leaving it to other existing legislation, the WIA wishes further engagement with ACMA on the matter at a later date.

3.5 LF and MF Technical Conditions - Schedule 1 Table C Items 1 and 2

In the 2022/31 consultation the ACMA considered the WIAs feedback on the technical limits applied to the LF and MF amateur bands, and proposed changes in alignment with the WIA's proposals.

The WIA welcomes these developments.

3.6 Access to the 50-52MHz Band by AOCP(S) licensees

The WIA welcomes the proposal by ACMA to add the 50-52MHz band as a secondary service to the list of bands accessible by AOCP(S) qualified radio amateurs, as advocated through various submissions over many years. In particular, the WIA welcomes the proposal by ACMA to make early changes to the existing amateur LCD and Overseas Class Licence LCD prior to the conversion of the amateur service to the new amateur service class licence. This will remove unnecessary discrimination between the two licence classes in this band.

4.0 Call Sign Administration

There are numerous elements of the ACMAs proposed callsign management arrangements where the WIA agrees, specifically:

- The rights for amateur radio operators to not have their full name and address exposed on a public database against their wishes.
- The concept of managing the definition of callsign templates, special event rules, allocation restrictions, and reservations outside of the class licence, via a published ACMA callsign assignment policy document.
- The callsign for life arrangements where a callsign allocation is not tied to qualification level.

The WIA also acknowledges that, where amateur licensees do want to have their contact details published, there are alternative commercial listing services available to them (eg qrz.com hosted in the USA). However, there are some critical elements of the proposed callsign administration arrangements where the WIA has a fundamental objection, and others which it believes can be improved. The WIA asks that ACMA reconsider its position on the following key aspects.

4.1 Renewal Management of Callsigns

The WIA strongly supports the ACMA proposal for callsigns to be revalidated periodically. This will remove the risk of callsign pool exhaustion:.

The Opportunity:

That the ACMA requires regular revalidation of the intent to operate using the amateur class licence, through revalidation of the call sign assignment by the callsign entity.

Recommendation 1:

To minimise the cost burden of administration, the WIA encourages ACMA to place the following conditions on the revalidation of callsigns:

A. The responsibility for call sign renewal be placed on the qualified person in circumstances where:
    a. The last time the renewal was made was more than 5 years ago
    b. The qualification holder has had a change of address
B. The call sign entity be required to provide an online portal that a qualified person can use to update their contact details and confirm their use of the callsign at a period of their choosing, but at no less than 5 year intervals.
C. The call sign entity is responsible for managing the renewal process and to maintain a private register of contact details for the person to whom each callsign is allocated and their associated qualification. The privacy of those contact details would need to be maintained, although there may be value in allowing them to be accessed by various branches of law enforcement.
D. The call sign entity to be authorised by ACMA to use the contact details provided, solely for the purpose of providing a callsign revalidation reminder notice (preferably by electronic means).
E. Call signs that are not revalidated after 5 years, including a 3-month renewal reminder period, to be flagged as dormant.
F. Dormant callsign allocations that are not revalidated after a further 5 years to be automatically released back to the call sign pool.
G. This same portal could be used, when additional evidence is provided (e.g. death certificate provided by an executor or next of kin), to quarantine callsigns of deceased operators.

4.2 Callsign Assignment Policy Document

The WIA supports the ACMA's proposed maintenance of a callsign assignment policy document. The WIA wants to see ownership of the document remain with ACMA.

The Issue: maintenance of amateur call sign allocation policy

Recommendation 1:

The WIA recommends that the call sign management policy be maintained by ACMA. Further, the WIA encourages ACMA to use a process similar to that used by ACMA for the Technical Liaison Group (TLG), when changes are proposed to be made so that amateur service wide input can be gathered and changes agreed by consensus.

4.3 Callsign Transfer Policy

The ACMA have recognised that, currently, a call sign is able to be transferred between individuals by the transfer of the apparatus licence. They are proposing a process where the person with the assigned call sign surrenders that call sign to the call sign entity, and nominates a new person to whom it may be issued. That new person will have one month in which to apply and pay for the call sign to be assigned to them.

The WIA has considered these arrangements and agrees they are appropriate on the condition that under the proposed class licence individual operators would have a limit on the number of callsigns they can hold. This is to prevent the establishment of grey markets where callsigns are sold to the highest bidder, particularly in highly sought after 5 character VK$xx callsign ranges. It is important for ACMA to understand that callsigns ultimately form part of a radio amateur operator's identity, and as such have similar values to, for example, personalised vehicle number plates.

The Issue: allow callsign transfers while limiting the risk of grey markets forming for call signs leading to profiteering.

Recommendation 1:

The WIA recommends that the call sign transfer as proposed by ACMA be adopted, but only on the basis that there are limits also placed on the number of callsigns any one individual or club can hold.

4.4 Use and Allocation of AX/VI/VK Prefix Special Event Callsigns

Generally, the circumstances for allocating special event prefixes are best described in the call sign allocation policy document maintained by ACMA. The WIA is supportive of this detail no longer being included in the class licence.

The WIA notes that the specific conditions that allow the AX prefix to be substituted for the VK prefix by Australian amateur radio operators on specific days have remained in the class licence. Given this intent , the WIA proposes one additional clause be added to address unforeseen use of the AX prefix , such has occurred recently on the death of the monarch:

The Issue: enable more discretion on the part of ACMA to authorise the use of the AX prefix in extraordinary or nationally significant singular events.

Recommendation 1:

That the following clause be added to the draft class licence:

12 Using call signs

(4) (d) The ACMA may, in addition to these dates, declare additional dates when there is an event of national significance.

4.5 Number of Call Signs Able to be Held

The ACMA has asked for responses in regards to the number of call signs able to be held by an individual under the draft class licence. The ACMA is currently proposing that no limit be placed on the number of call signs held by a licensee. The WIA opposes that position for the following reasons:

1. An amateur radio callsign is a valuable part of an amateur operator's identity. Most operators need only give their callsign to achieve instant recognition around the world. Given this inherent value, call signs can be highly prized and are potentially tradable.

2. The WIA, therefore, has concerns that with the removal of the economic barrier to holding a callsign, given it was previously attached to an apparatus licence that attracted a yearly fee, there will be some members of the amateur service who will endeavour to acquire many more call signs than perhaps they need, particularly given the fact that the call signs are proposed to be transferable.

The Issue: In order to prevent call sign hoarding and the creation of an artificial marketplace (particularly for 2x2 callsigns) the WIA proposes the following:

Recommendation 1:

1. That individual licensees only be permitted to hold a maximum of 2 permanent and 2 temporary callsigns, and;

2. organisations / groups be allowed to hold no more than 10 non-assigned callsigns, and;

3. callsigns held before the transition from apparatus to class licensing be grandfathered and transferred to the new arrangements regardless of any new limits applied.

This recommendation is consistent with conditions in New Zealand. The limits and intent being:

- 2 primary callsigns are allowed
    - To facilitate operators who want to have different callsigns for a main and a remote station.
    - To allow operators who have an old callsign from the original licence grade based allocation system, to be able to maintain that old callsign alongside a new callsign.

- 2 temporary callsigns are allowed
    - One temporary callsign would be typically used to hold a “contest 2x1 call sign” where renewal is required yearly.
    - The other temporary callsign might be used to operate a special event (eg VI) prefix callsign.
    - Use of the second call might also be desired if visiting and operating an Australian external territory where the operator wants to use the VK9 or VK0 prefix.

4.6 ‘On Air’ Usage of Callsigns

The ACMA has stated that it believes management of callsigns is something that belongs in an operator’s manual rather than in the class licence. The WIA, however, has observed some inconsistency in implementing this approach.

4.6.1 Addressing the problem of a series of transmissions

First of all, the WIA notes the following has been included in the draft class licence:

Observation: regarding usage of callsigns on air

12 Using call signs

(1) Subject to this section, a person must, when operating an amateur station, transmit the person’s call sign at each of the following times:

(a) the beginning of each transmission;

(b) the end of each transmission;

(c) if a transmission lasts more than 10 minutes – at least once every 10 minutes during the transmission.

The WIA supports this clause's inclusion into the draft licence because it ensures a qualified operator needs to seek a call sign assignment prior to commencing operation. The WIA considers this a mandatory requirement.

A difficulty, however, is created when there is a series of transmissions. As presented, amateurs would need to provide their identification each and every time they started a transmission. This is the opposite of the standard practices enabled by Part 2 Section 8 (2) of the current “Radiocommunications Licence Conditions (Amateur Licence) Determination 2015”.

In addition, the clause that specifies how a callsign is to be transmitted has been removed. The removal of the phrase “by voice (using the English language), by visual image or by an internationally recognised code.” opens the door to transmitting callsigns in an obscured way, so a station cannot be identified or even determined to be a legitimate user of the frequency band. This is something that is of high concern to the amateur service and could not be supported by the WIA.

Recommendation: To resolve the issue, the WIA proposes that Part 3 Section 12 be reworded as:

12 Using call signs

1) Subject to this section, a person must, when operating an amateur station, transmit the person's call sign at each of the following times:
   a) the beginning of a transmission; or series of transmissions;
   b) the end of a transmission; or series of transmissions;
   c) if a single; or a series of shorter individual transmissions; lasts more than 10 minutes – at least once every 10 minutes during the transmission events.

by voice (using the English language), by visual image or by an internationally recognised code.

4.6.2 Callsign usage in an emergency or emergency training exercises

Given that the ACMA has deemed it necessary to include clause 12 (1) in the draft class licence, the WIA then argues that it becomes unclear how continued support for the current "Radiocommunications Licence Conditions (Amateur Licence) Determination 2015" Part 8 (2A) section could be moved into the operators manual.

The amateur service long argued for the original inclusion of this privilege to support our emergency services role in the Australian community. The WIA argues that, apart from ensuring clarity that the existing condition can indeed continue to be used, it is also a valuable acknowledgement to the role amateur radio can play in handling emergency service traffic.

Therefore, the WIA strongly advocates the following be reintroduced into the class licence:

Observation: regarding usage of callsigns on air for emergency communications or training for emergency communications:

12 Using call signs

(1A) If:

(a) there are two or more qualified operators participating in emergency services operations or training exercises for emergency services; and

(b) two or more of those qualified operators are operating stations (***the group of stations***) for the purposes of those operations or exercises;

for transmissions relating to those operations or exercises the licensee must ensure that arrangements are in place for at least one station in the group of stations to transmit the call signs of all of the stations in the group of stations:

(c) at the beginning of a transmission, or series of transmissions;

(d) at the end of a transmission or series of transmissions;

(e) if a transmission or series of transmissions lasts for more than 30 minutes — at least once during each period of 30 minutes, or part thereof, of the transmission or series of transmissions;

by voice (using the English language), by visual image or by an internationally recognised code.

5.0 Proposed Operational Arrangements for the Amateur Service

5.1 Class Licence Migration Process

Page 11 of the consultation 2022/31 paper states that during the transition period between apparatus and class licensing, ACMA intends to operate both mechanisms in parallel.

Request for Feedback:

The WIA seeks a clarification from the ACMA on whether amateurs operating under their legacy apparatus licences will be allowed to access any new privileges afforded by the new Class Licence, or will they need to surrender those apparatus licences first?

5.2 Loss of Amateur Records from the ACMA RRL Database

The WIA has considered carefully the proposals for call sign management for the amateur service. While many of the arrangements are workable, the ACMA approach towards a register of amateur radio operators is still a point of significant concern.The WIA believes there is a loss of utility to the amateur service through the absence of a formal database of assigned callsigns. In assessing the impact of the proposed changes, the key elements of ACMA's proposed approach being considered by WIA are:

That the ACMA is proposing that only the following data be made available publicly:

a. *A list of callsigns available for allocation*
b. *A list of banned/restricted callsigns*

The ACMA is also proposing that the following data be stored solely with the "callsign management entity":

c. *A list of callsigns that are quarantined from re-issue for a period due to the death of the most recent call sign holder for up to 2 years*

And that the ACMA is proposing to discontinue any public listing of assigned call signs, or any information about those callsigns.

5.2.1 Loss of the public register - impact assessment

In assessing the true impact of the ACMA decision the WIA has considered the following scenarios:

Issue Considered	How does the issue arise?	Remedy
Removal of a key mechanism to identify if an identified transmission is in fact legitimately using a particular frequency band. This will directly impact the ability of self regulation within the amateur service.	The ACMA compliance group typically does not devote resources to minor breaches of the regulations by radio amateurs, which are often as a result of innocent mistakes. The amateur service itself, however, does conduct a degree of self regulation for minor non-compliance issues by virtue of being able to contact operators within the service and discussing their operating practices or technical signal quality issues directly with them. Removal of the full public domain RRL database completely removes this capability, impacting a key aspect of amateur service self regulation..	While the WIA does understand the concern expressed by some amateurs about their full name and address details being published in the public domain, we still feel strongly that some knowledge about whether a callsign has been legitimately allocated is vital to maintain at least a part of the self regulation activities that currently occur. At a minimum, the WIA strongly argues that a public database, maintained by the call sign entity, must be mandated by the ACMA. At a minimum, that database should publicly list the callsign, and the level of qualification associated with that callsign. It may also be worth including a last renewal date, which would also be beneficial to the callsign holder.
On air and off air harassment - the need to be able to identify if the harassment is coming from a legitimate amateur radio operator or by someone stealing their identity	Case #1: Issues arise from time to time where individuals will operate on the air under “fake” unallocated callsigns. This practice could be done to gain standing in one of the amateur awards programs. Case #2: More seriously, issues can arise where amateur radio is used to harass or victimise other amateur operators on air. The ability to at least identify whether a callsign is legitimately allocated or not is a vitally important first step.	The first step is to identify if the offending stations have any degree of legitimacy. A public listing of callsigns is necessary for this purpose. In addition, if amateur radio operators are required to register and renew their callsigns on a central database, law enforcement agencies can easily access that information.

Issue Considered	How does the issue arise?	Remedy
Inability for other authorities to independently verify whether an individual is a genuine amateur radio operator.	State planning acts grant planning exemptions for amateur radio operators to erect radio antenna towers. Those authorities are currently able to independently verify entitlement through reference to the RRL. That ability to directly and independently verify will be removed. New arrangements will be required to demonstrate that someone has the right to access the amateur class licence and hence is entitled to subsequent related rights/privileges such as the right to access town planning exemptions for radio towers.	Access to official documentation that formally links the qualification to the callsign, and subsequently to the new proposed class licence conditions, will be required to replace the loss of the official apparatus licence. This needs to be recognised as the equivalent documentation to the existing amateur apparatus licence certificate currently requested by these authorities.

The WIA strongly recommends that the ACMA require the call sign entity to publish not only a list of available callsigns, but also to publish the list of allocated callsigns and the associated licence grade.

5.2.2 The ‘call sign entity’ to be required to publish allocated call signs

The WIA does not accept the ACMA argument that this additional data publication requirement is a burden on the call sign entity, as they must already maintain records of available callsigns of which the allocated callsigns are just a sub-set. With the rest of the infrastructure in place, to provide the already agreed list of available callsigns it should be just a minor extension to also publish allocated callsigns.

In addition, the WIA requests that the call sign entity be required, through the deed with ACMA, to also publish the level of qualification associated with an issued callsign and the required renewal date. This will help operators keep track of the renewal due date for their associated callsign.

The Requirement: maintain the ability to enable some degree of self regulation within the amateur service and support the collection and maintenance of contact details for individual radio amateurs, giving due consideration to the relevant privacy legislation such that law enforcement agencies other than ACMA can continue to access that information when conducting investigations.

Recommendation 1:

1. That the ACMA must require the call sign entity to publish a list of assigned callsigns, the level of qualification associated with that callsign, and the last renewal date for the callsign.

2. That the ACMA requires the call sign entity to maintain a secure private database of contact details for an amateur station operator for the purpose of maintaining the call sign record and, subject to the relevant privacy codes and practices, the provision of contact information to law enforcement agencies.

5.3 Amateur Operating Procedures

As part of introducing the amateur class licence, the ACMA is proposing to cease documenting procedures for communications on air, instead leaving it to the amateur service to self manage the development and socialisation of these operating procedures.

While broadly supportive of the intent, the WIA has a concern where specific operating procedures are in fact required to be tested as part of the practical test component of the AOCP. Those requirements would be expected to be included within the AOCP syllabus.

The WIA does not wish to see a situation where the ownership or copyright of an AOCP syllabus passes to organisations that chose to “publish an operating manual”. The potential for that situation to produce different views on how to operate, and confusion about the procedures being examined for an AOCP qualification, must be avoided.

The WIA also does not wish to see a situation where there are various organisations or entities promoting a variety of operating procedures, especially where operating procedures are specified within the AOCP syllabus. The WIA firmly believes that the responsibility for the maintenance and ownership of the AOCP syllabus must remain with the ACMA..

The Opportunity: prevent confusion as to what the correct examinable operating procedures are.

Recommendation 1: that the ACMA maintain stewardship and publication of the operating procedures listed in the AOCP syllabus in support of the practical examination.

5.4 International Reciprocity Arrangements for AOCP(A) - Australians Overseas

The WIA has considered the information provided by ACMA on this matter and is satisfied that the arrangements in place will allow continued access to the CEPT multilateral reciprocal licensing system.

However, the WIA still has concerns about the documentation proposed to be made available to Australian amateur radio operators who wish to travel to non-CEPT countries and to obtain temporary amateur radio licences in those countries. That documentation is often required by customs authorities on entry and departure from foreign countries in order to support the transport of amateur radio equipment across international borders.

The key documentation required to support international licence mobility, as understood by the WIA, is:

- A certified copy of the amateur’s qualification documentation
- A copy of their amateur radio licence

With the class licence introduction, existing individually identified amateur radio apparatus licences will no longer be issued to Australian amateur radio operators.

The WIA has reviewed the arrangements for New Zealand radio amateurs, who operate under what amounts to an amateur class licence. The WIA believes the modifications and text included in the NZ equivalent of an AOCP qualification

certificate, combined with the Radio Operator Certificate and Callsign Rules (PIB 46) document, is sufficient to meet the requirements for international documentation and should be considered in the Australian context.

Recommendation 1: that the ACMA follow the example from NZ RSM for content provided on the amateur radio qualification certificate in order to meet the requirements for Australian citizens and residents seeking to obtain overseas amateur radio licences based upon their Australian qualifications, and corresponding rights to access the proposed Australian class licence.

The WIA has provided an example of an NZ certificate in Appendix A.2.

5.5 Arrangements for Amateur Radio Clubs

Firstly, the WIA welcomes the removal of the explicit regulatory logbook requirements for club call signs.

One area that is impacted by the move to a class licence is the allocation of callsigns via a licence that does not have a specific individual qualification attached to it. In reviewing the proposed arrangements to support future call sign allocation to radio clubs and other associated organisations, the WIA is concerned that the proposed arrangements do not address the following key requirements:

- Having the licence awarded to a club as the legal entity rather than an individual. (This may be ACMA's intent, however the mechanism to be used is not clear in the ACMA consultation paper.)
- Identifying what type of organisational structure is required in order to apply for a club callsign.
- Providing some form of suitable documentation for the club indicating the callsign is held by the club body, given the club itself does not hold the AOCP qualification.

The WIA would like further information on what documentation will be required for a club to apply for a licence, and what documentation will be forwarded to the club to confirm allocation of the callsign and the right for the club to allow that callsign to be used by any AOCP qualified member. See also Part 3.2.2 of this response.

We are also particularly concerned to ensure that the club call sign assignment process is unable to be used by unqualified persons to have a callsign assigned to a club entity that they create, and then they proceed to use the callsign despite not actually holding the relevant AOCP qualification themselves.

The WIA strongly feels that organisations that apply for and hold amateur radio callsigns must abide by the following:

Recommendation 1:

To be issued with a club call sign by the call sign entity, the following conditions must be satisfied:

- The organisation must be either an incorporated body or registered company.
- The charter of the organisation must include an intent to engage in matters relating to the amateur radio service.
- The call sign issuing entity shall maintain a record of the name and contact details of the responsible officer in the club / organisation who has the care and control of the use of the call sign, who themselves must hold a valid AOCP qualification.

6.0 Class Licence Drafting Review

The WIA also conducted a review of the drafting of the proposed class licence, and a comparison with the existing amateur radio apparatus LCD. The aim was to identify any other changes that may have a material impact to the operation of the amateur service. The following issues have been identified for the ACMAs consideration:

6.1 Ensure Callsign Assignment is Mandatory

The WIA requests ACMA address the following specific issues in the draft Class Licence, Part 1, Section 7, before proceeding. Part 1 Section 7 (1) states:

> **7 Call signs**
>
> (1) The Call Sign Entity ***may*** assign a call sign to a person.
>
> Note: See subsection 133(3) of the Act.

The WIA is concerned that this may be mis-interpreted as meaning you can operate without a callsign (on the basis that it isn't mandatory for the callsign entity to assign a callsign), while in Section 3 the ACMA has made it clear that a callsign is required to be used. This messaging could appear to be in conflict with Part 1 Section 7(1) due to the way the document is structured and the language used.

The Opportunity: ensure that the new class licence maintains absolute clarity, and that a callsign allocation against a valid AOCP qualification is a mandatory requirement prior to operating an amateur radio station.

Recommendation 1: reword Part 1 Section 7(1) as follows:

> **7 Call signs**
>
> (1) The Call Sign Entity ***shall*** assign a call sign to a person who holds the relevant qualification
>
> Note: See subsection 133(3) of the Act.

6.2 Removal of Retransmission Rules

The WIA notes that the ACMA has, in the class licence, not replicated Section 7 (6) (a), (b) and (c) which dealt with the rules around relaying another amateur station signal and the need to obtain their consent to do so.

The WIA sees this as a valid simplification of the regulations and supports this change.

The WIA also notes that sections 8A (1) - (4) have also not been replicated, which dealt with relaying of AOCP(S) and AOCP(F) qualified operator transmissions via third party repeater or other non-assigned amateur station transmitters controlled by AOCP(A) qualified persons onto frequency bands not authorised for direct use by the originating licensees.

The WIA is supportive of this change. The need to limit where the intelligence of a signal is relayed, such that it could only ever be heard on spectrum that the originating licensee was authorised to access directly, has been an impediment to many linked repeater networks for many years.

The requirement did not particularly make sense either, given that the originating station was actually operating their own transmitter within their own licence conditions as far as the technical parameters of their licence allowed. All of the subsequent licenced transmitters along the path were also being individually operated by qualified persons who held the correct qualification grade that supported operation of those third party transmitters. So, since each transmitter was individually controlled by someone qualified to do so, the fact they were relaying audio originating from a (potentially) unknown source transmission was irrelevant.

The WIA does note that there has previously been arguments to the extent that “it is an extension of operating privilege” beyond what was intended for the AOCP(F) or AOCP(S) licence grade. In response to such assertions, the WIA would say that the privilege extension is minor, as the lower grade licence holder can do no more than cause the distant transmitter to activate and deactivate. No other technical control is provided and no input is possible to vary the technical conditions the distant transmitter is operating under. On that basis, there really isn't any major extension of privileges that need to be restricted.

In summary, on this point, the WIA supports the ACMA decision not to include sections 8A (1) - (4) of the amateur apparatus licence into the new draft class licence.

6.3 Unattended Transmitter Control

The WIA has noted that the ACMA has, in the class licence, not replicated Section 9 (2) (b) of the amateur apparatus licence which states “*a transmission from the station can be terminated promptly if the transmission causes interference to another service”*. The WIA is concerned that the omission of this statement removes the impetus for installation of remote control systems that can ensure that if interference occurs, it can be promptly dealt with without waiting for a site visit to be arranged and carried out. The view of the WIA is that:

The Opportunity: this clause should be reintroduced into the draft class licence as:

13 Operation of station – purposes and transmissions

(4) (c) a transmission from the station can be terminated promptly if the transmission causes interference to another service.

6.4 Restrictions on Connection to a Public Telecommunications Network

The WIA has noted that the ACMA has, in the class licence, not replicated Section 11A of the amateur apparatus licence concerning interconnection of a telecommunications carriage service to amateur transmitters. The WIA is concerned that the omission of this statement opens the door to unlicensed persons gaining control of the activation of amateur transmitters for purposes that may lie outside of the objectives of the amateur service.

It is the view of the WIA that this is an unwanted development. It could open the door to difficulties internationally where such interconnection clauses also apply, to the extent that international amateur relay networks that utilise telecommunications carriage services as point to point tunnel links may refuse to continue allowing Australian operators to connect via their networks.

The firm view of the WIA is that:

The Requirement: this clause must be reintroduced into the draft class licence as:

18 Restrictions on connection to a public telecommunications network

(1) This section applies to:

(a) an amateur licence (amateur foundation station);
(b) an amateur licence (amateur standard station);
(c) an amateur licence (amateur advanced station); and

(2) The licensee must not, directly or indirectly, connect the station to a public telecommunications network, unless the licensee has implemented reasonable measures to ensure that only appropriately licensed persons access the station to transmit a signal to another amateur station.

(3) In this section:

appropriately licensed person means a person holding a licence that authorises that person to operate a station using the frequency and emission mode of the station being accessed.

Note A licensee who operates a station connected to the public telecommunications network is not required to authorise other persons to operate the station for the purpose of accessing the station.

6.5 Arrangements for organisations holding amateur licences

The WIA notes in section 5 of the ACMA consultation paper 2022/31 that *"The proposed class licence will authorise the operation of a station owned and operated by or on behalf of a club, provided that the operator of the station is a qualified operator or is supervised by a qualified operator, and the operation of the station complies with conditions set out in the class licence"*. However, nowhere in Part 1 Section 7 of the draft class licence is there any mention of anyone other than "a person" being issued a call sign by the call sign entity.

Callsigns for radio clubs and groups are currently issued via an apparatus licence held by the club. With the removal of that mechanism, and the fact that radio clubs as "organisations" not "persons" do not hold as an entity an AOCP qualification, the need to provide a new vehicle to identify "qualifying organisations" and issuing them with callsigns appears to be required in the actual class licence. Key to this is being able to have the entity apply for and hold a callsign without an AOCP, but then only allow the callsign to operate on the air if the club committee or governing body authorise its use by a suitably qualified person who is a member of that club.

The Opportunity: provide a mechanism for organisations, where amateur radio is a part of their charter, to formally acquire a callsign for use by members of the organisation who hold relevant AOCP qualifications, or others under their direct supervision.

Recommendation 1: provide an additional clause in Part 1 Section 7 similar to:

7 Call signs

(1A) The Call Sign Entity ***shall*** assign a call sign if requested to an organisation where it has provided evidence that it has the objective of participating in the amateur radio service as part of its charter.

6.6 Recognising Superseded Qualifications - Part 1 Section 9

The WIA notes that the ACMA has explicitly listed acceptable qualifications proposed to permit access to the amateur radio class licence. The WIA however notes that there is no mention of any previous qualifications that have been issued in Australia together with their current equivalence.

Can the ACMA please clarify its intent for holders of:

- LAOCP - Limited Amateur Operator's Certificate of Proficiency
- NAOCP - Novice Amateur Operator's Certificate of Proficiency
- NLAOCP - Novice Limited Amateur Operator's Certificate of Proficiency

The WIA believes that it would be appropriate to reference any previous AOCP licences classes that have been superseded within the new class licence in order to remove any doubt about their legitimate right to access and use the new draft class licence.

The Opportunity: for clarity, the previous qualification types issued in Australia should be added to the new draft class licence

Recommendation 1: provide an additional clause in Part 1 Section 9 similar to:

9 Recognising qualifications

(1A) The ACMA may, in writing, declare that a previous no longer available qualification be considered equivalent to one or more of the following:

- a recognised qualification (Limited Amateur Operator's Certificate of Proficiency) is equivalent to an AOCP(Advanced) type
- a recognised qualification (Novice Amateur Operator's Certificate of Proficiency) is equivalent to a AOCP(Standard) type
- a recognised qualification (Novice Limited Amateur Operator's Certificate of Proficiency) is equivalent to a AOCP(Standard) type

6.7 Definitions - Part 1 Section 5 (1)

6.7.1 Definition of 'mean power pY'

All technical definitions of terms such as power need to have a clear basis, where possible drawn directly from internationally recognised sources such as the ITU radio regulations. In particular, the WIA observes that there has been a change in the definition of power in the draft class licence which has led to ambiguity. To rectify this, the WIA urges ACMA to adopt the definitions of power defined in ITU-RR Article 1.156 and 1.158 which states:

ITU-RR Article 1.156 and 1.158

1.156 ***power:*** Whenever the power of a radio transmitter, etc. is referred to it shall be expressed in one of the following forms, according to the class of emission, using the arbitrary symbols indicated:

- *peak envelope power (PX or pX);*
- *mean power (PY or pY);*
- *carrier power (PZ or pZ).*

For different classes of emission, the relationships between peak envelope power, mean power and carrier power, under the conditions of normal operation and of no modulation, are contained in ITU-R Recommendations which may be used as a guide.

For use in formulae, the symbol p denotes power expressed in watts and the symbol P denotes power expressed in decibels relative to a reference level.

1.158 ***mean power*** (of a radio transmitter): The average power supplied to the antenna transmission line by a transmitter during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating conditions.

Doing so would maintain consistency with the source of the pX definition which has also been drawn from ITU-RR 1.157.

The Opportunity: provide clarity on how mean power is defined in the draft class licence

Recommendation 1: reword the power definitions as:

5 Interpretation

(1) ***pY*** means the average power supplied to the antenna transmission line by a transmitter during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating conditions.

6.7.2 Definition of ‘recognised overseas qualification’

The WIA believes that the proposed wording of the recognised overseas qualification will lead to uncertainty and confusion. The definition as presented, while referencing overseas qualifications, then proceeds to only name Australian qualifications and fails to indicate that prior agreed equivalents are also acceptable.

The WIA therefore recommends that this definition be reworded like the following example:

The Opportunity: provide clarity on the definition of 'recognised overseas qualification'.

5 Interpretation

(1) ***recognised overseas qualification*** means any of the following that has been issued or awarded by a body, association or person outside Australia:

(a) an equivalent recognised qualification (Advanced Type);

(b) an equivalent recognised qualification (Foundation Type);

(c) an equivalent recognised qualification (Standard Type).

as per the reciprocal agreements table as published from time to time on the ACMA website.

6.8 Restrictions on Certain Frequency Bands - correction to Section 17

Section 17 contains an error in the frequency allocation. The section refers to 3.4-3.7GHz when the amateur band in question only spans 3.4-3.6GHz. To avoid any confusion, this should be corrected.

The Opportunity: correct Part 3 Section 17 (1) as follows

(1) A person must not operate an amateur station on a frequency within the 3.4 GHz **to 3.6 GHz** frequency band if the operation would cause a transmission to occur in the area described by the HCIS identifiers in the table in Schedule 3.

7.0 Response to ACMA Questions - Class Licencing

7.1 Question 1 - AOCP(S) access to 50-52MHz

Do you see any reason for not extending secondary user access to the 50–52 MHz band for Standard amateurs? If yes, what is your reason? (See section 3.)

The WIA fully supports AOCP(S) (and grandfathered NAOCP and NLAOCP) licence class qualification holders being granted access to the 50-52MHz band, in alignment with the current technical conditions that apply to these licence grades. The partial band restriction no longer makes sense now that channel 0 analogue TV has ceased operation.

7.2 Question 2 - Call sign transfer

What are your views on the proposed policy on call sign transfer? (See section 4.)

The WIA supports the ability for qualified operators to still be able to transfer call signs from one operator to another, but only if there is also a limit placed on the number of callsigns held to prevent call sign hoarding and unintended call sign marketplaces emerging.

7.3 Question 3 - Call sign renewal

Will the proposed 'regular check' – to confirm whether a person is still using their call sign – be a sufficient method of ensuring there are enough call signs (in combination with other factors, for example, the high number of available call signs, deceased amateurs, most amateurs only wishing to hold one call sign)? (See section 4.)

The proposed regular "call sign check" in principle should resolve the call sign pool exhaustion problem. As outlined above, the call sign check should be on the basis that:

A. The operator is responsible for revalidating their call sign every 5 years
B. The renewal process should be able to be conducted purely online
C. The call sign entity maintains a ,at least, the last known email address for the call sign holder, which is not made public but is used to send a call sign renewal reminder 3 months before the renewal date).
D. If the renewal is not made, the call sign should be marked dormant - but not be reallocated for a further 5 years
E. After 5 years of being in the allocated but dormant pool, the callsign should be released back to the pool for reallocation.
F. During the dormant period, a renewal reminder should be emailed yearly.

This level of interaction should minimise the cost of providing the service to the call sign entity. Nonetheless, should the costs of managing the system not be able to be absorbed into the other amateur radio activities of the call sign entity (e.g. provision of exams at this stage) then they should be permitted to recover costs by charging a renewal fee (noting that the cost of managing the renewal fee collection may itself significantly inflate the cost of providing the service).

The other operational aspect of managing the call sign renewal process is that of ensuring the data is preserved and transferred accurately, should a future management contract be awarded to a different organisation. Continuity of the service is paramount. The WIA therefore would like to understand from ACMA some more of the operational arrangements intended to ensure the integrity of this service, given the high value callsign possession has within the amateur service.

7.4 Question 4 - Quantity of call signs held

What are the benefits or disadvantages of our proposal not to limit the number of call signs that may be assigned to a person? (See section 4.)

Call sign “quantity” today is directly influenced by the monetary cost of holding one - namely the existing amateur apparatus licence fee that needs to be paid for each callsign, which is currently attached to an apparatus station licence. This cost is one of the major limiting factors that prevents those interested in holding more than one callsign from holding many call signs.

With the removal of a yearly fee to hold a call sign, levied by the ACMA, and no other limits in place, the WIA is concerned some operators will take the opportunity to “hoard” call signs (particularly from the VK&yy callsign series), potentially with a view to trying to sell transfer rights. This would not be an acceptable outcome.

Therefore, the WIA policy is to request ACMA to limit the number of call signs as per our submission above (2 permanent and 2 “temporary” non-assigned call signs maximum for individuals, 10 permanent for clubs, and that existing multiple call sign allocations be grandfathered). Repeater and beacon system call signs are excluded from these calculations.

7.5 Question 5 - Call sign arrangements - other concerns

Do you have any concerns with the other proposed call sign management arrangements? If so, what are they? (See section 4.)

The remaining concerns for callsign management are:

- The lack of a public register of assigned amateur callsigns, the related licence class and the callsign renewal due date.
- The way call signs will be assigned to amateur radio clubs and groups.
- The lack of clarity on the process ACMA will use to seek amateur service engagement, and the degree of input from the amateur community to operational policy documents held by ACMA. The WIA proposes arrangements similar to the ACMA Technical Liaison Group approaches, used for commercial and government spectrum users, may be an appropriate way forward on this matter.

Full details of our concerns are set forth in sections 3 to 6 of this submission.

7.6 Question 6 - alternatives to the RRL

In the absence of amateur and station information being contained in the Register of Radiocommunications Licences, are there any amateur-operated registers or other existing voluntary registers that you would use? (See section 5.)

As far as the provision of equivalent information to the RRL, the WIA is aware of qrz.com, a site hosted in the USA, that amateurs frequently use to access this type of information. Information in qrz.com for Australia is inserted on a voluntary basis by amateurs who are interested in making contact online. (It is worth noting that the FCC has an arrangement where US amateurs are directly inserted into qrz.com).

The WIA can also see the situation arising where, with the loss of the RRL reference data, local organisations may establish new voluntary opt-in equivalent services to support activities such as the exchange of contact confirmation cards (QSL cards) between stations.

7.7 Question 7 - CEPT licensing

Do you anticipate any difficulties operating your station in Conference of Postal and Telecommunications Administrations signatory countries? (See section 5.)

On the basis that the ACMA instructs AMC to create amateur qualification certificates with the forms of text etc equivalent to the approach carried out in New Zealand (see appendix 2 for a sample), the WIA believes that there should be no impact given the communications ACMA has indicated they have had with CEPT.

PART 2

HIGHER POWER PRIVILEGES
FOR AOCP(A) QUALIFIED OPERATORS

8.0 Higher Power Operation

The WIA welcome's the willingness of the ACMA to once again examine the conditions under which Australian amateur radio operators might be permitted to operate using higher transmitter powers. This is seen as a significant development for the amateur service in this country and is something the WIA encourages both the ACMA and radio amateurs around Australia to tackle thoughtfully.

It is important to the amateur service that, together, we achieve these new privileges while at the same time ensuring they are used safely and responsibly, with due regard to the compliance with the ARPANSA standards.

The WIA objectives are:

WIA Objectives:

1. *That Australian radio amateurs have well managed and safe access to higher power on relevant parts of the radio spectrum as part of the standard conditions of the amateur class licence, as is the case in New Zealand and many other countries around the world.*

2. *The WIA expects this to take place in a phased approach, over a 1-3 year timeframe, with the method of introduction being designed to provide the necessary training and support to Australian radio amateurs that will ensure the ACMA has confidence that the required standards are being observed.*

8.1 Historical Approach

Up until now, the only permitted access for higher power permits has been to conduct experimental communications involving reflecting signals off of celestial bodies (including the moon, meteors and even some of the other planets and objects in the solar system). By their very nature these experiments are niche in nature, being conducted by a very small number of dedicated experimenters.

These permits have been granted on an adhoc case by case basis when the interested individuals make specific applications to the ACMA. At this time, the ACMA has only permitted these permits to be used at specified locations after giving due consideration to EME, EMI, and radio-communications interference risks. As these permits have all been for use on one or more of the 50, 144, 432 or 1296MHz bands, the consideration of risk would have been focused on those occurring in VHF and UHF spectrum.

8.2 Amateur Service Interest in Accessing Higher Power

Given the currently very niche usage of higher power in Australia by radio amateurs, it is difficult to predict what the real interest is. To more clearly establish the demand, the WIA asks the following question of its members:

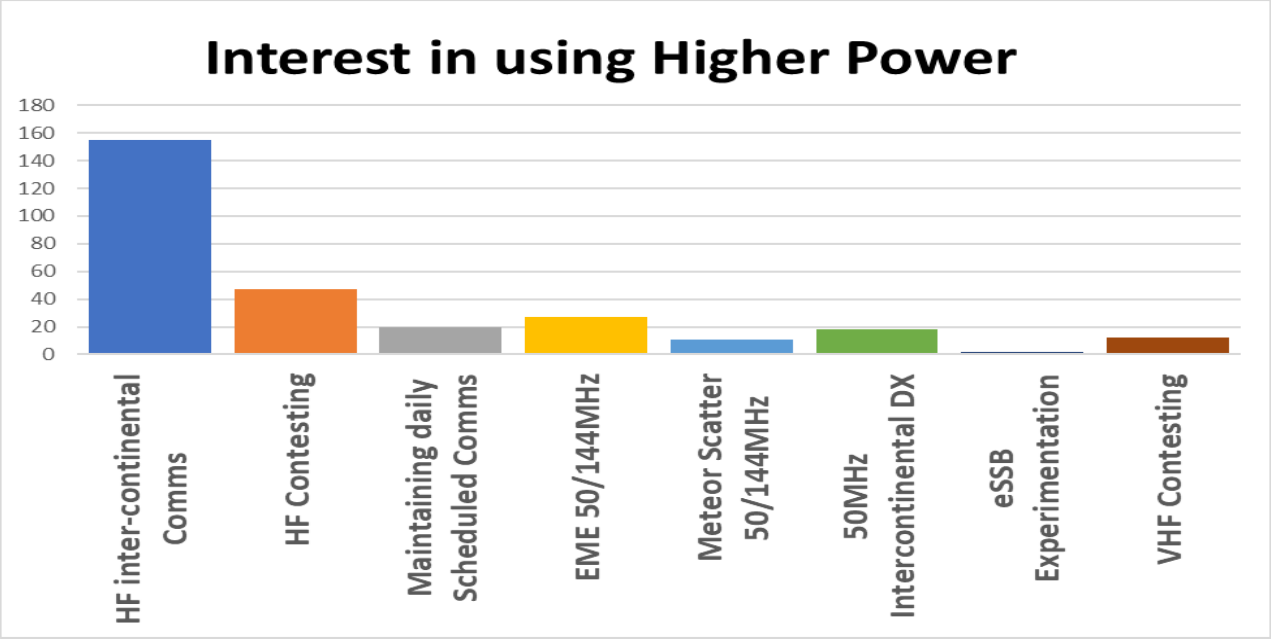
Question to WIA Members:

" What activities within the amateur radio service would you like to participate and learn about that you believe would be enhanced or enabled by an increase in the maximum permitted transmitter power"

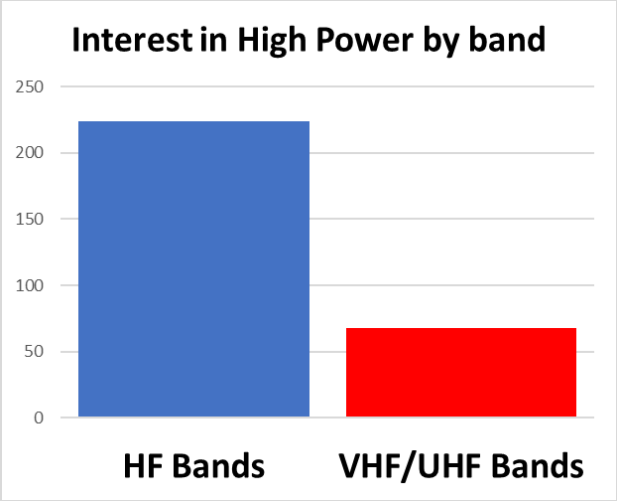
The response received in an early poll suggests there is significant interest in gaining access to higher power privileges on the HF spectrum, with the VHF and UHF bands being a distant second.

Activities that respondents to the survey said they valued are:

- HF inter-continental communications
- HF radio sports & contests (where operators attempt to communicate with as many stations as possible in a limited time period)
- Maintenance of regular HF scheduled communications - often with amateurs at sea or travelling by land to remote places
- Moon bounce communications on 50MHz and 144MHz
- Meteor scatter communications on 50MHz and 144MHz
- 50MHz inter-continental Sporadic E and TEP communications
- High fidelity voice communications (using wideband SSB or AM modulation modes on HF)
- VHF contesting



The primary interests are predominantly below 30MHz.



8.2.1 Why the interest in higher power on HF?

The WIA believes the particular interest for higher power on HF is a result of one of the principal aims of the amateur service - intercommunication. Intercommunication fundamentally means being able to deliver a signal to a distant receiver, but that ability is affected by:

- Antenna design
- Radio propagation loss
- Receiver sensitivity
- Receiver location radio frequency noise floor

The last point is not controllable by the transmitting station and is becoming more problematic. .

With the ever growing amount of electronics found in society today, there has been an ever increasing level of radio frequency pollution emitted. In many places around the globe, that pollution has lifted the typical RF noise floor by at least 10dB over the last 2 decades. The problem is, in fact, often worse in developing countries due to low cost equipment being sold which typically lacks any sort of EMI suppression. Even here in Australia, with relatively high compliance to EMC standards requirements , the amount of radio frequency pollution is still increasing year on year.

Common sources of interference to amateur HF receivers include poor quality solar power systems, incorrectly installed LED lighting, poor EMI suppression on motors and machinery (such as pool pumps and on hot water systems), digital switching based electronic power supplies, and domestic electronics (such as battery chargers, TV sets, computer monitors and power supplies and VDSL services).

Given this increasing RF pollution problem, there are few mechanisms left available to radio amateurs to help them maintain or improve the reliability of HF amateur radio communications, given that greater receiver sensitivity and bigger antennas cannot combat local EMI. Given the laws of physics as applied to radio propagation, and the uncontrollable nature of the ionosphere, and the practical restrictions in antenna size, the only technique left that can compensate for increased local EMI levels at the receivers is to increase the transmitted power.

When we then look specifically at the Australian circumstances we find, more and more, that an Australian amateur radio

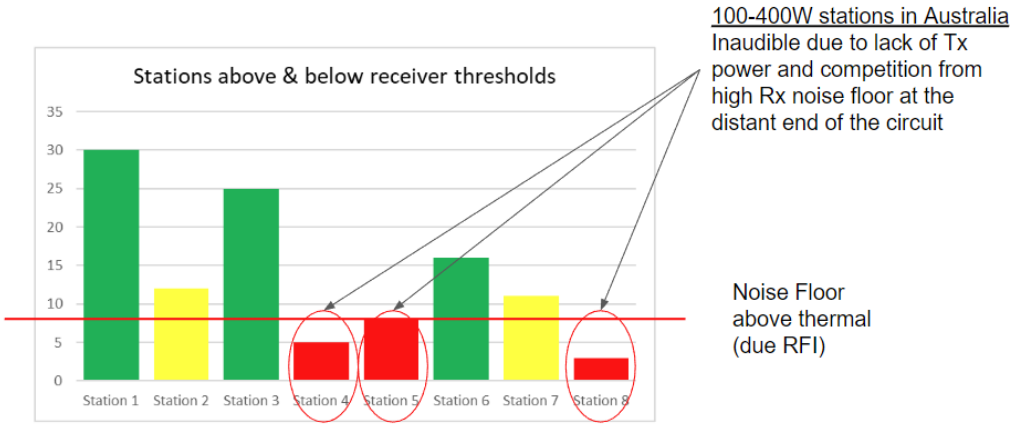
operator's ability to communicate with distant radio amateurs is degrading due to the existing transmitter power limits of 400W pX or 120W pY and the lack of technical reciprocity.

In short, we can often hear distant stations, but they cannot hear us.

The following diagrams attempt to convey illustratively the problem faced by Australian radio amateurs, and the benefits to amateurs of increasing transmitter power.

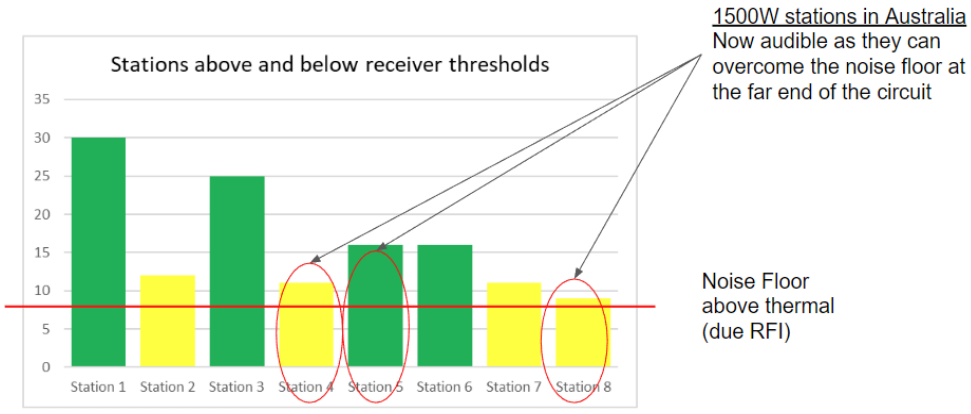
At 400W pX, Australian amateurs often fall just below the threshold for being detected in distant continents due to a combination of distance (additional path loss) and the elevated noise floor at the receiving end.

Example of received signals in Europe - 400W



If the transmitter power is increased by say 6dB (up to 1.5kW pX), Australian signals would have a greater probability of being received.

Example of received signals in Europe - 1500W



The other factor that drives Australian radio amateurs to seek access to higher transmitter power is simply the tyranny of distance. Compared to Europe and the Americas, Australia is a LONG way away!

Consider typical northern hemisphere communications:

- Communications within Europe typically occur over 2000 - 4000 km paths
- Between Europe and North America most paths are 3000 - 6000 km

Compare this with Australia:

- Most international communications using HF radio by radio amateurs involves minimum radio path distances of 7,000 - 15,000km
- When “Long Path” communications are required, this extends up to 27,000km (e.g. when communicating with South America over the north pole).

These path length inequities alone are sufficient to place Australian radio amateurs at a very significant disadvantage.

8.2.2 VHF & UHF use of higher power

When the WIA asked for member feedback about higher power privileges, the other major area of interest (as expected) was in the VHF and UHF bands - but predominantly in the VHF spectrum. What was interesting, however, was that it was much more experimental in nature. The requirement to use higher power to communicate on VHF and UHF spectrum is varied and focused more on specific experiments and activities that, due to their complexity, are not widely practised.

Examples of higher power use cases on VHF/UHF and above include:

- High power (up to 1500W pY) is needed for 50MHz moonbounce operation
    - (1200W pY + 12dBi gain (equivalent to 550W pY using one of the very narrow band and signal processing WSJT digital MFSK transmission modes) is a minimum station to achieve 2 way communications)
- Higher average power (up to 250W pY) is needed for 144MHz moon bounce and meteor scatter experiments with up to 16-18dBi antenna gain
- Higher power is advantageous for 50MHz inter-continental ionospheric and TEP propagation experiments (again using 1kW pX or 400W pY depending on the mode)
- VHF radio-sport contests (where up to 1kW pX is considered desirable at least on 50MHz).

Two of these activities, involving communications by reflecting signals off of “celestial bodies”, are of course already able to radio amateurs by accessing the existing high power permit arrangements.

8.2.3 Comparing the risks between HF and the VHF/UHF/SHF bands

In considering higher power privileges for the amateur service it is important to properly understand the risk profiles of the various activities. The human body's ability to absorb whole body electromagnetic radiation (EMR) increases with frequency across the HF spectrum and then plateaus throughout the VHF spectrum. At UHF and above, it becomes more localised, affecting the body in different ways.

HF activity is therefore less risky than VHF and UHF operations because:

- Achievable antenna gain on HF is typically low - between 6-9dBi and;
- The lower human body absorption at those frequencies is reflected in the ARPANSA exposure limits.

VHF activity, on the other hand, carries a higher risk because:

- High antenna gains are easy to achieve (12-20dBi is possible) with correspondingly higher field strengths.
- EMR exposure at VHF frequencies has more stringent limits than at HF. This is also reflected in the ARPANSA exposure limits.

While both can be used safely, the ability to do so using higher power at VHF in dense locations is less likely. Greater care in conducting assessments at VHF is therefore required in order to ensure that the station operating conditions maintain compliance with the ARPANSA standard.

8.2.4 Should all amateurs have access?

A key point for Australian radio amateurs to consider is the question of whether all radio amateurs should have access to higher power.

From the outset, given the technical challenges involved, the WIA is absolutely not supportive of these very high transmitter powers being permitted for use by AOCP(F) licence holders. In then considering the AOCP(S) licence grade, the problem becomes one of maintaining a suitably sized stepping stone between licence grades.

Due to the additional education burden that it would also place on AOCP(S) , the WIA recommends that only AOCP(A) licensees be considered for higher power privilege extension at this time.

The WIA also firmly believes that, over and above the licence grade distinction, that there will need to be limitations on the use of higher power by geographic locality. The amateur service needs to accept that not all locations are suitable for operating at higher transmitter powers due to the proximity of their stations to the general public and neighbouring properties and dwellings.

- It will be challenging if not impossible, for example, to operate with higher power from urban environments due to the lack of separation between antennas and neighbours, where both EME and EMI problems can arise.

At the same time, however, the WIA argues that those radio amateurs who operate their transmitters in low density/rural settings, do have the ability to safely experiment with and operate transmitters at higher power . Further, amateurs in those circumstances should be able to determine compliance using simpler protocols and methods to those amateurs operating in urban areas without degrading compliance with the ARPANSA standards.

8.2.5 Considering reciprocity and power limits in other countries

In considering basic reciprocity, particularly on the HF bands, the WIA has reviewed many of the transmitter power limits applied to amateur radio operators around the world.

The following table provides a sample for consideration:

Nation	Power Limit
Canada	2.25kW (pX)
Baltic States	2kW (pX)
Brazil	2kW (pX)
USA	1.5kW (pX)
Belgium	1.0kW (pX)
Spain	1.0kW (pX)
New Zealand	1.0kW (pX)
Norway	1.0kW (pX)
South Africa	1.0kW (pX)
Russia	1.0kW (pX)
Germany	800W (pX)
United Kingdom	400W (pX)
Australia	400W (pX)

This demonstrates that Australian amateurs are typically disadvantaged by 3-8dB compared to equivalently qualified amateur operators in other nations.

8.3 Managing the Risks From Allowing Higher Power

The WIA understands the concerns expressed by ACMA that need to be addressed before any increase to amateur transmitter power limits can be considered are:

From the ACMA proposal:

> interference risk to other radiocommunications services (including co or adjacent channel assignments)
> the proposed location of the station and, in particular, proximity between the station and residential premises
> the qualifications held by the applicant/person to whom the licence would be issued (that is, Advanced qualifications only)
> the likelihood of the applicant/station complying with applicable EME compliance methodology and record-keeping requirements
> any other matters we consider relevant (for example, antenna height/direction, public accessibility of station).

Further, it is clear that the ACMA needs to have confidence that amateur radio operators will comply with the ARPANSA standard and the necessary record keeping. While easier to manage for new people taking up qualifications in the future, the pathway for improving education and compliance for existing AOCP(A) licence holders also needs to be considered. The WIA will separately address this issue below.

Other concerns can be summarised into the following key themes:

- Electromagnetic Emission (EME) management and safety of the transmitter
- Electromagnetic Interference (EMI) from the amateur transmitter into surrounding equipment
- Interference into adjacent radio communications services

8.3.1 Electromagnetic emissions (EME) management

First and foremost, the WIA fully supports the use of the ARPANSA RPS-S1 standard to define the EME emission safety limits that apply to the amateur service. The WIA would also, as part of any trial, seek to provide training and other necessary information to existing amateurs to support the necessary education process.

The WIA strongly feels that, by formally addressing EME education up front, the situation that arose in 2012/13, where EME was only raised as a compliance concern late in the trial following a demonstrated lack of understanding by some trial participants, can be avoided.

The WIA is particularly supportive of developing methods for safety assurance based on the processes outlined in AS/NZS 2772.2. The WIA understands (from contacts it has made with the EMR management industry) that arrangements and systems can be developed using methods defined in AS/NZS 2772.2 that are practical and fit for purpose. It is acknowledged, however, that it would take some time to develop these fully, so allowances for that development time need to be included in any trial planning.

If this work is undertaken correctly the need for independent assessments of amateur stations should be avoided in most cases. Instead, assisted peer reviewed modelling, calculation methods, and documentation approaches following the

guidance provided in AS/NZS 2772.2, would be sufficient to allow reliable demonstratable compliance to the ARPANSA EME standards. The WIA is of the view that the reliability and quality of this approach, where particular focus is placed on ensuring the correct uncertainty budgets are included, should be acceptable to the ACMA.

8.3.1.1 Introducing a geographic factor to EME Assessment

While recognising that the standard ARPANSA EME safety levels do not change depending on the environment, the level of risk in different environments does indeed change. The WIA argues that understanding and recognising this variability of this risk will aid the management of a staged introduction of higher power privileges into the amateur service.

This is one of the fundamental considerations the WIA wishes to see included in any amateur service higher power trial framework.

Enabling higher power use in low density/rural areas, where the risk of public exposure is virtually non-existent, would allow for more opportunities for trial participation, allowing commensurately more opportunities to test technical training materials and make corrections to processes and procedures, in environments that are inherently safer. .

To illustrate the point, the WIA has defined several typical situations where amateur transmitters may be operated, specifically on the HF amateur spectrum. In each of these situations, it has ranked the risks of each of the core concerns to the general public and in particular to neighbours of the relevant amateur stations. The following table illustrates the circumstances, and in our opinion the levels of regulatory oversight required, matched with the level of difficulty and associated costs of achieving compliance:

Amateur Service HF Spectrum Higher Power Risk Assessment vs Station Location (Rating 1-5)	**Dense Urban:** Small Blocks of land (<400m2 with areas less than 10x10m in which to install antennas and with neighbour dwellings <10m away from the antennas	**Suburban:** Larger traditional 700-1000m2 blocks with neighbour dwellings typically 15-20m away from the antennas	**Rural:** Rural settings where land size is typically 1 hectare or more and where the nearest neighbour is more like 50-100m away
EME (RadHaz)	**4**	**3**	**1**
EMI (Domestic Equipment Interference)	**4**	**3**	**1**
Interference Radio communications Interference (HF)	**3**	**2**	**1**

The scale for these ratings considers:

- Rating 4 - much harder to pass compliance - do not expect access to higher transmitter power in most cases
- Rating 3 - Compliance processes to be strong enough to remove the risk of harm or otherwise block use
- Rating 1-2 - Simplified compliance processes only required. The risk can be easily be controlled and be contained with suitable margins such that it will not impact a member of the public, or a neighbour

The WIA foresees that stations in locations defined by the Rating 4 and above category should NOT expect to access higher transmitter power privileges from those operating environments in most situations. Managing EME and EMI under those circumstances even under Schedule 1 Part 3(1), (2) and (3) rules is problematic.

Stations in the rating 3 category may or may not be able to access higher power, depending on whether they are able to comply with the ARPANSA emission limits. Stations in those types of built environments should expect a rigorous (but not onerous) process for assessment. Where they do pass the ARPANSA emission limits, they will also need to take responsibility for managing any EMI problems caused to neighbours so they do not become a burden on the ACMA. This category of station should only be permitted later in the trial once best practice management procedures, tools, and training materials have been developed.

Meanwhile, stations located in areas that fall under category 1-2 should have no difficulty complying with the ARPANSA limits. Simple self assessed compliance measures could be used with additional margins applied to protect against the lack of verifiable measurements.

The WIA therefore proposes that such a tiered approach to EME management should be a part of any trial arrangements, based on the geographic location of the station, its local environment, and the provision of suitable exclusion zones..

Phase 1 : Self-assessment – Higher Power / Low Risk Stations. Stations that fall under the current Schedule 1 part 3(2) and 3(3) rules that typically apply for low and most current permitted transmitter power levels today.

Phase 2: Self-assessment – Higher Power / Medium Risk Stations. Stations that fall under the current Schedule 1 part 3(4) or part 4 rules that operate transmitters in suitable low density/rural environments where ARPANSA standards compliance can be achieved through exclusion zones and simplified compliance protocols.

Phase 3: Peer Reviewed Assessment – Higher Power / Higher Risk Stations. Stations that fall under the current Schedule 1 part 3(4) or part 4 rules that operate transmitters located in urban or suburban environments are required to comply with a more stringent peer reviewed assessment process and a “calculate and review before commencing use” approach. Measurement based approaches using relatively inexpensive equipment (such as “RadMan”[1] EME meters) and suitable training can also be considered here, given that training to use such devices is not onerous.

8.3.1.2 Use of existing Low Risk transmitters definitions for the first phase of the trial

Stations located in the types of low risk environments described above would, on analysis, most likely find they fit within one of the existing EME low risk scenarios defined by ACMA in Schedule 1 of the draft class licence.

For example, a typical high-power station may have the following characteristics:

- A frequency and power level of 14MHz at 1.5kW pX;
- A modulation factor of 50%;
- A Tx/Rx duty cycle of 50%;
- An antenna gain of 6.5dBi;
- With the antenna mounted more than 10m above the ground, and;
- no buildings within 10-15m of the tower higher than a single story.

That station would have an average EIRP of 32.2dBW or ~1700 Watts. Therefore, it currently fits under the definition of a low risk station in the proposed schedule 1 of the draft class licence.

[1] https://www.airmet.com.au/narda-radman-personal-radiation-monitors-series

As an example of a risk mitigation approach to a future trial, setting conditions similar to those above combined with amateurs initially only being allowed to operate higher power in low risk scenarios, and in low density/rural locations, should be ample to ensure public safety. This would also provide a proving ground for EME assessment calculators, controls based on those calculations, and training on how to prepare and maintain compliance documentation.

The establishment of such training conditions where processes can be safely developed to the satisfaction of ACMA and the amateur service should be viewed as a valuable first step. Such an approach is highly recommended by the WIA.

Questions to WIA Members:

1. Do you support a staged approach to higher power trials, where only stations in low risk scenarios would initially be permitted on the basis that they would be a development ground for improved EME assessment and compliance processes. (Stations that constitute a higher risk would be introduced in later phases if they can demonstrate and manage full compliance with ARPANSA safety standards.)

2. The WIA seeks feedback from amateurs on whether they support establishing a WIA managed service that could provide training, information, assistance, on-line assessment tools, guidance on application of those calculation results to actual environmental assessments and a central database for storing individual station EME records and other documentation associated with improving amateur service compliance with ARPANSA safety standards.

8.3.2 Managing Electromagnetic Interference (EMI)

The ACMA has raised electromagnetic interference (EMI) as a concern, where an amateur radio transmitter may interfere with the correct operation of 3rd party electronic equipment.

EMI issues are generally well understood by amateur radio operators, and a variety of techniques are used to mitigate EMI issues if and when they arise. Although the introduction of digital television and improved electronic design techniques have generally reduced the susceptibility of modern electronic equipment to EMI issues, EMI remains an important issue for radio amateurs.

The solutions to interference issues are usually amicably managed between the radio amateur and the affected neighbours, and can involve fitting additional chokes or ferrites to audio equipment, high pass or band pass filters to broadcast receivers, or bandpass/low pass filters to the output of amateur transmitters.

Considering that the majority of EMI issues are successfully dealt with directly by radio amateurs within their own community with the current permitted power output of 400W pX, the proposed 4-6dB increase in power is not expected to result in a significant increase in EMI events.

8.3.3 Management of Radio Frequency Interference (RFI)

The ACMA is rightly concerned about the risks of interference from high power transmitters to other radio communications services. RFI impacts to other radio communications services can be due to harmonic and spurious emissions falling outside of amateur bands. The risk of this, however, is well controlled and understoodPart 3 Section 14 of the proposed Class Licence specifies the permitted level of unwanted emissions.

8.3.3.1 Spurious Emissions, Harmonics & Receiver Blocking Interference

Modern amateur transmitters have very low levels of spurious emissions and, unless faulty, are not likely to exceed the current limit with only a modest 4-6dB increase in power output.

The same is the case with harmonic radiation, which, if it did occur, would most likely fall in a harmonically related amateur band away from commercial services.

Receiver blocking is another form of interference to be considered. Blocking may occur when a transmitter is operating in close physical proximity to a receiver operating on a nearby frequency where the receiver filters are less effective. The greatest concern is the blocking of receivers commercial service operating in close proximity to a higher power amateur transmitter.

Our engineering assessment of the risk of receiver blocking to adjacent fixed HF services on a prolonged basis is that it would be very rare.

On the VHF/UHF bands, however, it is more of a concern due to the high EIRP which is possible due to the use of highly directional antennas. The WIAs suggested approach for general management of higher power by the amateur service on VHF and above bands would be to determine a suitable protection zone, based on frequency offset from the amateur band, and a consideration of how close the amateur station expects to be operating to to a fixed service station (details of which can be obtained from the ACMA Register of Radiocommunications Licences (RRL).

8.3.3.2 Interference between Amateur stations

The ACMA has raised a concern that increasing the transmitter power for AOCP(A) licensees may disadvantage other users, and other groups of users, within the amateur bands.

The WIA believes that this risk is misunderstood by ACMA due to the very nature of the amateur radio service and the techniques used by stations to communicate.

First of all, due to natural propagation effects on HF, there are circumstances where stations can inadvertently cause interference to other stations using the same frequency. However, as a non-assigned service (setting aside fixed repeaters and beacons), every station is frequency agile and is free to move frequency at any time within the amateur spectrum allocations.

When stations become aware of interference or cross-interference, they can simply change frequency. In this way, conflict is naturally avoided. It is part of the core understanding of every radio amateur that this is normal behaviour. A 4-6dB additional transmitter power will not fundamentally change that response.

Additionally, some operating modes invented by radio amateurs (such as FT8) are designed to tolerate decoding two 50Hz wide MFSK signals overlapped by as much as 49Hz. The powerful decoding algorithms used on these modes are able to resolve both signals regardless of the amount of overlap, and even with a substantial difference in relative power (10-15dB difference is common).

So, in summary, the concern raised by ACMA about increasing the power disparity between AOCP(F) and AOCP(A) licensees is not considered to have a material impact on the enjoyment by all operators of the amateur radio spectrum.

8.3.4 Training, Qualifications & Syllabus

As highlighted earlier, one of the key elements of any introduction of higher power privileges for Australian radio amateurs will need to be increased education on how to comply with the ARPANSA public safety emission limits. While most amateur radio activities are low risk, once transmitter powers exceed 100W the situation changes.

Although risks can be controlled, and situations can be orchestrated that can very effectively manage the situation, the WIA understands that the ACMA needs to have a high level of confidence that amateur operators will undertake suitable measures to ensure the safe operation of their stations. This is especially true as, in Australia, the ACMA is the entity responsible for the administration of mandatory radiation safety standards (ARPANSA standards).

The WIA sees three alternate approaches to this issue:

1. The approach we understand is being taken by ACMA whereby amateurs are required to specifically register to access higher power privileges, and in doing so will be required to furnish substantial amounts of station configuration data that ultimately has to be reviewed, and approved as being compliant with a range of concerns by both a third party assessment process and direct ACMA evaluation, (all at a substantial cost).

   OR

2. That the amateur service operators wishing to access higher power have to register with the authority that they intend to experiment in this area, and that the amateur operators commit to undertake suitable self education and training to ensure they can design, build, document and operate ARPANSA compliant installations ensuring that public safety is maintained at all times. In addition, the amateur operator needs to undertake to be responsible for resolving EME complaints arising from their activities, and ensure that the risk of interfering with other radiocommunications users is appropriately mitigated.

   OR

3. That amateur service operators be required to undertake further formal study in order to obtain an additional AOCP(E) competency, in addition to their existing AOCP(A) certificate of proficiency, that ensures they are fully aware of their responsibilities and are capable of managing their use of higher power privileges in a fully compliant manner as well as all associated EMI and RFI risks. This would necessarily entail the creation of an AOCP(E) additional competency syllabus and examination that would need to be sat and passed in addition to the AOCP(A) certificate of proficiency.

The WIA is concerned that the current approach being taken by ACMA will lead to significant regulatory burden on both ACMA and the radio amateur. However, the WIA is also aware that ACMA has serious concerns at the likely lack of compliance that could arise given a purely voluntary learning and training environment. The WIA strongly feels that the only way that the Australian amateur service will gain relatively unfettered access to higher power privileges will be through improved training, certification under an ACMA recognised proficiency, coupled with a suitable reporting framework for registering EME compliance assessments (option C below).

Questions to WIA Members:

Do you

A. Do you support the ACMA approach of requiring heavy third party supervision of amateur station configurations and EME compliance in order to gain access to higher power privileges

OR

B. Do you support a purely self training approach to learning how to properly design, implement and document the operation of a higher power amateur station,

OR

C. Do you support the development of an AOCP (E) additional proficiency that needs to be acquired in addition to the AOCP(A), along with a more formal self reporting compliance model in order to be permitted higher power privilege access?

The WIA is also interested in hearing from ACMA on their preferences for an approach to permanently introduce higher power privileges to Australian radio amateurs and in particular whether they would view option C sufficiently favourably to consider working with the WIA and the Australian amateur radio community to establish such a framework?

Regardless of Option A, B or C, there may still be merit in allowing an early staged trial to proceed prior to the full establishment of suitable sets of resources, as only by field trial and development will it be possible to fully determine what the practical requirements need to be. An early trial, focused on only allowing low risk transmitter scenarios, is seen as a stepping stone to a wider long term deployment.

8.4 ACMA Scientific Licence Approach

The ACMA has proposed to authorise higher power privileges on a station by station, location by location, and case by case basis, using the scientific apparatus licence framework. This would enable ACMA direct oversight of the way it is being used, and to facilitate recording of who is authorised to use higher power privileges in the ACMA Register of Radiocommunications Licences (RRL).

From the ACMA proposal:

These changes will allow Advanced amateurs to apply for assigned scientific licences for certain experimentation uses, including reflecting signals from a celestial body, as well as inter-continental ionospheric and trans-equatorial propagation experiments.

These activities involve research, investigation, testing, and trialling of equipment, which are activities compatible with the uses of a scientific station in section 7 of the Radiocommunications Licence Conditions (Scientific Licence) Determination 2015 (the Scientific LCD) and the definition of a scientific assigned station and a scientific licence in the Radiocommunications (Interpretation) Determination 2015.

The WIA interprets this approach as being a response to the ACMA concerns around the ability, and indeed willingness, of some radio amateurs to actually comply with the EME regulations. However, the WIA is concerned that the level of supervision being proposed will lead to significant regulatory overheads, and significant costs.. The sustainability of this approach will need to be carefully assessed.

The following conditions are applied to the Radiocommunications Licence Conditions (Scientific Licence) Determination 2015:

Radiocommunications Licence Conditions (Scientific Licence) Determination 2015

7 Use of stations under other licences

A scientific station may be operated by the licensee if the station is operated primarily to perform any of the following activities:

(a) research into radiocommunications;
(b) investigation of radiocommunications;
(c) instruction in radiocommunications;
(d) demonstration of equipment;
(e) testing of equipment;
(f) trials of new radiocommunications technology;
(g) radio propagation path testing.

Note The issue of a scientific licence does not mean that an assigned frequency or any other frequency will be available to the licensee beyond the expiry date of the licence or under any other licence type for any purpose.

8.4.1 Conflict with the definition of the amateur service

What the WIA fundamentally observes however is that these conditions do not align with the purpose of the amateur service as defined by the International Telecommunications Union (the ITU), which are:

1.56 of the Radio Regulations (RR) defines the amateur service as:

"A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.";

The key point is that Scientific licences do not support **inter-communication, which is a basic purpose of the amateur service and is one of the prime drivers for higher power operation.**

White the ACMA is correct in their proposal that activities like propagation based experiments could indeed be considered under the scientific licensing framework, fundamentally that is only true if one of the core reasons for the amateur service's existence is denied, that of being allowed to communicate with fellow amateurs. The WIA can not therefore see how the scientific licence framework can legitimately be extended to cover all likely future uses of higher power privileges by the amateur service. Short term use of the framework to conduct a trial aside, the longer term viability of this approach appears unworkable given the definitions within the scientific licence LCD framework.

For this reason the WIA does not support the use of the scientific licence framework as a suitable vehicle to manage higher power privileges in the amateur service.

8.4.2 Scientific licence cost burden

The WIA is concerned that the costs of the scientific licence approach, noting also the comments about ACMA's intent for amateurs to seek independent EME assessment of their stations, place a considerable barrier before the amateur radio service in attempting to access these privileges. Noting that the ACMA was intending to base further decisions on higher power arrangements on the rate of take up by the amateur service, the WIA is concerned that the cost barriers presented will significantly suppress demand and lead to false conclusions of perceived demand.

As the WIA understands the proposal, the following would be the likely costs:

Item	Description	Cost
Application Fee	Scientific Assigned application fee (sourced from the consultation paper) [2]	$606
The Schedule 1 Part 4 EME assessment	Third party EME compliance assessment	~$5000
TOTAL		~ $5600

Given that the "self training" aspect of amateur radio implies experimentation and regular station reconfiguration, the costs of independent RF assessments for each station variation would be prohibitive, and probably deny radio amateurs access to one of the fundamental tenets of the amateur radio service.

[2] https://www.acma.gov.au/apparatus-licence-fee-calculator

8.5 WIA Proposal for Higher Power Privileges

The WIA is looking forward to working with the ACMA to achieve the goal of lifting the maximum transmitter power for the amateur service in Australia.

However, the WIA believes that the approach proposed by ACMA is problematic and needs further development. The long-term sustainability of the current proposal, and the higher regulatory burden placed on radio amateurs, do not appear to be in balance with the actual technical and operational risk. At the same time, the WIA understands the ACMAs motivation in tackling this issue given the problems identified in the last trial associated with EME compliance. A balance needs to be found where the ACMA concerns are addressed, the amateur service is upskilled, and public safety is assured.

The WIA argues that there is an alternate **staged** pathway available for improving the access to higher power privileges for Australian radio amateurs, while maintaining a high level of compliance and public safety without excessive regulatory overheads and costs.

8.5.1 Stage 1 - extend the current arrangements

The proposed pathway by ACMA of extending the current arrangements to include new use cases is a route supported by the WIA. This proposal supports a training pathway to achieve compliance by either direct self managed learning or through the ultimate establishment of a new AOCP qualification level. Both approaches will need to progressively develop new reference and training materials, so a staged approach with suitably managed risk profiles at each step is recommended..

Aspect	Description
Licensing instrument	Noting the general move towards class licensing and the removal of unassigned radio amateurs from the ACMA RRL database, the WIA proposes that the existing Amateur (Apparatus) LCD instrument have a new special category added for “Amateur Unassigned - special use” licences. Such licences would be issued under general LCD conditions that define the requirements particularly for operating using the higher power privileges. It also supports re-entry into the RRL of records which would enable the tracing of amateurs participating in this activity, supporting the requirement, outlined by ACMA, of providing traceability of who has been authorised to access the higher power privileges that drove, in part, the ACMA scientific licensing proposal. This could also be used as a placeholder also for the small number of amateurs that hold current permits for “communication via celestial bodies” on VHF.
Proposed Spectrum	Noting the WIA assessment of the principle spectrum radio amateurs are seeking access to higher power limits is the MF and HF bands (between 1.8-30MHz), the trial should start with only access being made available in those areas. It may be appropriate to also exclude the 10.1 to 10.15MHz band from the trial as amateurs are only secondary users in that band which is shared with defence users domestically.

Aspect	Description
Permitted Power	The initial limit should be set to 1.5kW pX (SSB) or 500W pY (all other modes)
Trial location Management	The initial trial should only be conducted at a trialists permanent home station during Phase 1. (Portable operation could be allowed from phase 2)
EME Management	The initial trial should focus on training and utilising self assessment techniques as defined in ACMA's existing frameworks, such as the described low risk case to enable initial access to the higher power limits while ensuring EME safety. The trial should also have a training focus looking to establish and improve EME assessment and record keeping compliance. Given that the initial trial would typically be operating under what ACMA has defined as "low risk" in existing instruments, the risk profile that the operators, the general public and the ACMA are exposed to is low. The WIA would like to see all participants achieve a compliant set of EME station documentation at the end of 3 months. Documentation for the low risk case will need to be better defined, but should be based on AS/NZS 2772.2 External certification of individual stations should not be required in most cases provided support systems and tools are available and independently verified.
EMI Management	Operators should be required to take responsibility for resolving any EMI complaints received as a result of their use of higher transmit power. Further, they should be required to report any instances where they are approached regarding any EMI / BCI / TVI situations that occur when they are utilising the higher power transmitter limits, and outline what steps they took to resolve the issues reported. This information should be shared with the amateur community as part of improving education on these issues. Should the issue not be resolved to both parties' satisfaction within 30 days, the affected amateur radio operator should cease higher power transmissions until a solution is found.
Radio-communications Interference	The WIA does not see this as an engineering risk when only considering the HF spectrum between 3 and 30MHz. As a result, it believes this should not need to be an objective during a phase-1 HF-only trial..
Operating Model	This first stage of the trial would provide opportunities for measurements to be made of live stations, policies and procedures to be developed, management systems to be created including a tool box of calculation and assessment capabilities and ultimately syllabus to be written and draft examination papers to be developed should the pathway be chosen to add an additional element to the AOCP(A) as a separately examinable module in support of high power safety and compliance management.

8.5.2 Stage 2 - expand Stage 1 & commence stage 2 VHF/UHF trial

Stage 2 would be designed to deliver the learning outcomes and materials built during stage 1, while developing the additional information required to support VHF/UHF and higher applications.

Aspect	Description
Licensing instrument	Continue with the “Amateur Unassigned - special use” category within the Amateur (Apparatus) LCD proposed in stage 1.
Proposed Spectrum	Continue with the higher HF bands (between 3-30MHz) excluding 10.1 to 10.15MHz and extend the trial into the 50-54MHz and 144-148MHz bands.
Permitted Power	The HF limit should continue to be to 1.5kW pX (SSB) or 500W pY (all other modes) The VHF limit should be 1kW pX or 330W pY (for the initial trial only)
Trial location Management	Portable operation to be allowed, with suitable geographic clauses included that enable operation in open farmland /rural/remote settings where the minimum distance to a 3rd party dwellings is more than 100m, and on VHF and above predefined minimum permitted distances to an assigned radio communications services.
EME Management	The second stage trial should focus on expanding the low risk situation descriptions for HF, and the commencement of formal assessment requirements for tier 2 higher risk stations. Tier 2 requirements dictate that formal compliance documentation preparation skills, and knowledge of how to use suitable online assessment tools, needs to be demonstrated on request. Stage 2 also sees the inclusion of the VHF bands into the trial. Where EIRP will exceed 3200W, peer review should be required by qualified (but not necessarily NATA accredited) persons. The WIA would allow participants to register their compliance documentation in a central location that the ACMA could be provided access to (not unlike the RFNSA system used by the telecommunications sector)
EMI Management	Participating operators are required to take responsibility for resolving any EMI complaints received as a result of their use of higher transmit power.
Radio-communications Interference	As per the proposals in the trial location management section above.

8.5.3 Stage 3 - move the higher power and compliance requirements into the class licence

Stage 3 would signal the end of the trial phase and the normalisation of the new transmitter power limits for the amateur service.

This would also mark the transfer of the requirement from the amateur (apparatus) LCD into the amateur class licence. At this stage recording of the location of individual stations would no longer be required in the ACMA RRL, but those wishing to utilise power levels > 120W pY or 400W pX would be required to maintain compliant records and have them available

for inspection on request. It may even be appropriate that they be stored on a central EME database accessible only by the record owner and the ACMA (unless presentation to the public is explicitly allowed by the record owner) in order to simplify compliance inspections.

8.5.4 Further consideration of other higher power use cases

Finally, in considering ACMA's medium term approach, the WIA believes that any solution needs to reflect a workable operational outcome where safety is being properly managed without excessive and burdensome regulation.

In summary, the WIA supports the following principles to guide the development of any high power framework for the amateur service in Australia.

- Compliance with ARPANSA EME levels and AS/NZS 2772.2 calculated safety zones for the placement of antennas and protection of public health
- A multi-tiered approach to what is considered low risk for EME assessment purposes - with a broadening of the low risk scenarios to address other obvious low risk settings that are currently defaulted to being considered high risk
- A restriction on higher power to limit EMI risks in dense urban areas where dwelling lots are <400m^2
- An agreement that higher risk situations can be managed by calculation and peer review - and that in accordance with the EME standards, a full NATA accredited assessment is not necessary
- Potential limitations on the use of more than 400W pX on the 10.1-10.15MHz band
- Restrictions on changing the existing conditions below 1MHz
- No other arbitrary restrictions about operational location or individual station registration requirements are required. The only governing factor is ARPANSA compliance.

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9.0 ACMA questions about higher power

9.1 Question 8 - Higher power via Scientific licensing

What are your views on the proposal to allow Advanced amateurs to apply for assigned scientific licences for certain experimentation uses, such as reflecting signals from a celestial body as well as inter-continental ionospheric and trans-equatorial propagation experiments? (See section 6.)

As discussed in detail in section 6 of this submission, the WIA does not support the use of the scientific licensing approach for the provision of higher power permits to operators within the amateur radio service. Both its regulatory structure, the lack of an “inter-communication” clause in the scientific licence (LCD) and the administrative costs involved with a scientific licence approach combine to make this a highly unattractive way forward for administering access to higher power permits for the amateur service. It seems far more appropriate, efficient and considerate cost wise to retain the amateur radio apparatus licence option in conjunction with a modified LCD, specifically for the purpose of authorising participating amateurs, for the duration of the higher power trials.

Notwithstanding this, the WIA is still determined to find a way forward to permit amateur radio operators in Australia access to higher transmitter power privileges, and to that end has proposed an alternative framework for ACMA’s consideration.

9.2 Question 9 - Higher power use cases

Noting the proposal mentioned in 8, are there other amateur experimentation uses that require higher power that you think should also be considered under assigned scientific licensing arrangements? (See section 6.)

There are many use cases where the amateur service wishes to obtain access to higher power privileges, but none of these fit under scientific licensing.

9.3 Question 10 - Higher power - medium term view

What are your views on the medium-term proposal to allow Advanced amateurs to apply for authorisation for other higher power use-cases under certain conditions? Please provide brief information to help us understand your view. (See section 6.)

The WIA views on the need for higher power, the risks and mitigations available for those risks relating to higher power privilege use and a way forward for how administration of higher power are set forth in section 6 of our response to this consultation paper.

9.4 Question 11 - 1kW power limit

Is a 1kW power limit appropriate? Why or why not? If not, what alternative do you propose and why? (See section 6.)

The WIA contends that, given other similar services (such as the Maritime mobile class licenced service) also have access to higher power already, that arrangements should on first principle be able to be considered on parity with those services, which are in alignment with the USA Extra Class amateur radio licences. That power level is 1.5kW pX for SSB/ VSB TV or 500W pY for all emission modes.

Should the ACMA not be persuaded by that argument, then the WIA would be willing to discuss alternative proposals..

9.5 Question 12 - frequency bands to exclude from higher power

Are there particular bands that you consider should or should not be able to be accessed for Advanced amateur higher power operations? Which band(s) and why? (See section 6.)

The WIA strongly feels that the 30m amateur band (10.1 to 10.15MHz) should be excluded from any higher power privileges given how narrow the band is, the fact that amateurs are secondary users of the band, and there are active fixed station users of that spectrum in Australia.

The 476kHz and 137kHz bands should also be excluded.

During the trial period, except for grand-fathered permits, the WIA would also support phase 1 of the trial only having access to the HF and 1.8MHz amateur bands.

9.6 Question 13 & 14 - Higher power user case details

What use-cases would require stations to operate at power limits for Advanced amateurs higher than the 400W currently permitted? (See section 6.) For each use-case mentioned in 13, please briefly answer: a. Why is a higher power limit needed? b. What are the specific limitations of the current power limit? c. What power level is required? d. What is the technical description of this power level requirements (for example, transmitter output power, emission mode)? e. What amateur service frequency bands would be used? f. How often will a higher power level be required? g. What is the location of the station?

The WIA has noted the fine detail and distinction sought by ACMA on this question, and in the approaches outlined by ACMA. The WIA has provided some use case data in this submission in section 6.

However, the WIA believes that the drive for the level of detailed information expressed here will lead to an extremely restrictive approach with significant regulatory overhead and burden being placed on both the amateur service and the ACMA hence the WIA does not support this approach.

9.7 Question 15 - Higher power limitations

Should potential higher power authorisations be limited by location, position, event or something else? (See section 6.) Please provide details to support your answer.

The WIA believes that higher power authorisation ultimately should be limited by what is required to ensure public safety and the maintenance of the quiet enjoyment of the radio spectrum by other spectrum users. This means that the only limitations that should be required are those to ensure EME meets the ARPANSA standard, EMI is properly managed and some reasonable provision for the avoidance of (highly unlikely) interference to other radiocommunications services be considered on VHF and above. All other explicit factors that have been considered by ACMA in this question should not be included, as they apply additional unnecessary regulatory burden on both the amateur service and the regulator.

The practical outcome of the WIA position is that, yes, radio amateurs are unlikely to be able to operate at higher power levels in dense urban and many suburban environments, however that outcome should be driven by science based assessment, not arbitrary regulation. Should the ACMA want to control this particular aspect over and above reliance on the ARPANSA emission limits, then a geographic description is one that the WIA is prepared to develop in conjunction with ACMA.

10.0 Conclusion

The WIA values an ongoing and productive relationship with the ACMA and welcomes the opportunity once more to provide feedback on the ACMA proposals to revise the regulatory arrangements that support the amateur radio service in Australia.

We are very pleased to see ACMA take on board many of the items the WIA provided feedback on in the previous 2021/01 ACMA consultation, and this will certainly enable the smooth transition to a Class Licence and further development of the relationship between the ACMA and the amateur community.

The WIA has put forward proposals to address the minor issues created by the creation of a Class Licence through the continuation of the use of callsigns and a callsign register and we hope these are looked upon positively. We look forward to working with the ACMA to further develop these proposals.

The WIA is also pleased to see that the ACMA has commenced a process to reconsider the transmitter higher power privileges arrangements for the amateur service in Australia. We acknowledge that there is still a substantial difference of opinion as to how to achieve a workable outcome, however the WIA is willing to work with the ACMA in a collaborative and open way to reach an acceptable outcome. To this end the WIA has provided a proposal with a range of options to carefully navigate this sensitive issue. We hope these will meet with a positive response and we look forward to being involved in discussions to further develop and realise these options.

Again, we thank the ACMA for the opportunity to comment on their proposals affecting the amateur community.

A.1 Appendix I - Value Of The Amateur Service

One of the goals of a simplification agenda should be to enhance the value of the amateur service to Australians; understanding and recognising that potential is key. Approaching the reform with a view to delivering increased value to the Australian people, through value creation as well as cost reduction, is fundamental to meeting the expectations of the amateur service.

Areas where the amateur services brings value to the community with no cost to the Government and community include:

A.1.1 Inter-communication

- **Inter-communication** - facilitating the exchange of ideas, wellbeing, connectedness and understanding across Australia's multicultural community.

  In particular, using the idea of self reliant communication, the amateur service supports the health and wellbeing of the Australian community through events such as:
  - Scout & Guide Radio Jamboree [3] held globally each year.
  - Community sporting events [4] such as canoe marathons, car rallies, cross country cycling events and more.
  - Radio Sport activities enable physical fitness and activity through (for example) the ARDF international competitions which combine orienteering with radio direction finding, as well as the Summits on the Air program (mixing mountaineering with amateur radio).

  The value of these community based, community delivered communications capabilities via radio are hard to calculate in dollar terms, but are nonetheless invaluable to the function of such events. Indeed, during this COVID19 pandemic, more and more people have turned to, or returned to, amateur radio as a way of keeping in touch with community, friends and family across town or across the world.

A.1.2 Self Training

- **Self training** - promotion of Scientific, Technology, Engineering and Mathematics (STEM) accessibility throughout Australian society, not just through formal education channels. This delivers value through:
  - School science programs [5] through, for example, communicating with the International Space Station (ARISS) [6] or flying and tracking high altitude balloons (e.g. Project Horus [7]).
  - Engineering professional development through self training on advanced communications techniques particularly on the VHF/UHF/Microwave bands.
  - Citizen science programs such as wildlife tracking, space weather monitoring [8], radio propagation studies[9] and many more

[3] https://www.jotajoti.info/
[4] https://www.areg.org.au/archives/category/activities/rpm200
[5] https://www.sarcnet.org/
[6] https://www.ariss.org/
[7] https://www.areg.org.au/archives/category/activities/project-horus
[8] https://www.solarham.net/
[9] http://wsprnet.org/drupal/wsprnet/map

- Advanced Communications Techniques Developments are being undertaken by individuals and groups across the country are facilitating new advanced communications techniques including developing new modes and methods of communication via radio (for example the development of HF digital voice communications using the Codec2 based FreeDV [10]modulation or advanced weak signal communications using modes (using the WSJT-X software suite) [11] such as FT8, JT65, WSPR, MSK144 and many more.
- Building Practical skills within graduate professionals and helping bridge the gaps that have appeared in formal radiocommunications educational pathways (eg the loss of the BOCP and TVOCP certifications) through self training able to be undertaken within the amateur service.
- Recommendation ITU-R M.1043-2 [12] addresses the use of the amateur and amateur-satellite services in developing countries. It recommends that administrations encourage and facilitate the amateur and amateur-satellite services in order to develop radio operator skills, train engineers and technicians to design, construct and maintain radio equipment and systems, assist in forming groups capable of providing local support, exchange technical and operational information, experiment with new technology, and establish stations in rural and remote areas, among several other objectives.

A.1.3 Disaster Relief Communications

- **Disaster Relief Communications** - where in Australia organised self-training obtained within the amateur service facilitated by groups such as the Wireless Civil Emergency Network (WICEN) [13] has enabled operators from the amateur service to act for the direct benefit of the community. For example:
  - Relief Operators in disasters - WICEN operators played roles as relief operators in disaster communications centres during the Summer 2019/20 bushfires.
  - Secondary backup communications - WICEN trained amateur radio operators also provided communications networks to the community on the NSW south coast 2019/2020 when the public and government communications networks failed.
  - Primary disaster communications channels - amateur radio was one of the first means of communications re-established in Darwin in 1975 after Cyclone Tracey - being used to carry news and information for the ABC and 2GB out of Darwin.
  - International Disaster communications [14] - the amateur service is recognised as a vital source of skilled operators able to enter disaster areas and set up communications networks with limited support. It was the amateur service that stepped in during several of the Caribbean hurricanes in the last couple of years. This capability of the amateur service is in fact recognised and encouraged in the ITU Radio Regulations through ITU-RR 25.9A.
  - Recommendation ITU-R M.1042-3 [15] addresses disaster communications in the amateur and amateur-satellite services. It is recommended that administrations encourage the development of amateur service and amateur-satellite service networks capable of providing radiocommunications in the event of natural disasters, that such networks be robust, flexible and independent of other telecommunications services and capable of operating from emergency power, and that amateur organisations be encouraged to promote the design of robust systems capable of providing radiocommunications during disasters and relief operations.

[10] https://freedv.org/
[11] https://physics.princeton.edu/pulsar/k1jt/wsjtx.html
[12] http://www.itu.int/rec/R-REC-M.1043/en
[13] https://wicen.org.au/
[14] https://www.iaru.org/on-the-air/emergency-communications/
[15] http://www.itu.int/rec/R-REC-M.1042/en

A.2 Appendix II - Example of NZ Amateur Qualification

Certificate Number:
Client Number:

NEW ZEALAND
Radio Operator's Certificate of Competency

(Issued under the authority of section 134 (1)(e) of the Radiocommunications Act 1989 and regulation 24 of the Radiocommunications Regulations 2001 and remains valid unless revoked by the Chief Executive under section 26 of the Radiocommunications Regulations 2001)

This is to certify that

meets the competency requirements for the

General Amateur Operator's Certificate

issued under the authority given by the Ministry of Business, Innovation & Employment.

Description of Holder:

Height:
Complexion:
Colour of Eyes:
Colour of Hair:
Date of Birth:
Place of Birth:
Country of Birth: NEW ZEALAND
Address:

New Zealand

Allocated Callsigns (issued pursuant to the provisions of Schedule 1(8) of the regulations)

Primary Personal Callsign: Secondary Personal Callsign:

The competency requirements to which this certificate relates accord with the International Telecommunications Union Recommendation ITU-R M.1544, and are further prescribed in Schedule 4 to the Radiocommunications Regulations 2001.

The passed examination corresponds to the examination described in CEPT Recommendation T/R 61-02 (HAREC).

L'épreuve en question correspond à l'examen décrit dans la Recommandation CEPT T/R 61-02 (HAREC).

Die abgelegte Prüfung entspricht der in der CEPT-Empfehlung T/R 61-02 (HAREC) beschriebenen Prüfung.

The above named person meets the requirements to operate an Amateur radio station in accordance with the provisions of the Radiocommunications Regulations (General User Radio Licence for Amateur Radio Operators) Notice 2013, or a notice in replacement thereof, granted by the Ministry of Business, Innovation & Employment under Regulation 9 of the Radiocommunications Regulations 2001.

CEPT Amateur radio licence equivalent in accordance with Recommendation T/R 61-01.

CEPT amateur équivalent licence radio conforme à la Recommandation T/R 61-01.