



Comments in Response to  
Notice No. SLPB-002-20

*Consultation on the Technical and Policy  
Framework for the 3650-4200 MHz Band and  
Changes to the Frequency Allocation of the  
3500-3650 MHz Band*

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Submitted by  
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## **Introduction**

1. Department of National Defence Frequency Spectrum Management (DND FSM) is grateful to Innovation Science and Economic Development Canada (ISED) for the opportunity to participate in the *Consultation on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band*.
2. This submission from DND FSM takes into consideration only DND's locations and services that could be potentially impacted by the proposed changes.
3. Not all questions listed in the consultation are addressed in this document, because DND FSM does not have the required expertise, nor, is it appropriate to comment on areas not concerning DND.
4. In general, DND FSM is supportive and in favour of Telesat proposal in Annex H.



## **DND FSM Comments for SLPB-002-20 ISED Consultation**

### ***Q3***

*ISED is seeking comments on how the difference in technical rules between the U.S. and EU could impact Canada's ability to leverage the economies of scale from the global 3800 MHz ecosystem. In particular:*

- a) would the difference in technical rules (such as out-of-band-emission (OOBE) power limits) result in two distinct region-specific equipment ecosystems*
- b) which equipment ecosystem would be more suitable in the Canadian environment (noting that Canada has, for the most part, aligned with the U.S. on low- and high-band spectrum for 5G but in the mid-band, Canada is more aligned with the EU in the 3500 MHz band (3450-3650 MHz)) and specifically, whether Canada should generally align its technical rules with the U.S. or the EU in the 3800 MHz band.*

**DND FSM Answer:** In general, due to the many interactions with United States Department of Defense and other U.S. agencies, DND would prefer alignment with the U.S. decisions. Particularly the alignment noted with the EU is in the low band and outside the concern for domestic C-Band FSS.

### ***Q8***

*ISED is seeking comments on the proposal to maintain a primary allocation to FSS in the entire 3700-4200 MHz band and the proposal that existing FSS earth stations in satellite-dependent areas remain licensed in the entire 3700-4200 MHz band.*

**DND FSM Answer:** DND would require protection for the complete FSS band that remains after the spectrum auction, i.e. the 4000-4200 MHz band. If capacity is utilized in the band below 4000 MHz, the earth station would require protection via coordination and not technical means. DND completely agrees, the proposal would potentially protect most if not all of our remote assignments such as North Warning System and High Arctic Data Communication System. Agreement with our provider is being sought to retune as necessary. Ultimately, DND supports Telesat's proposal as per Annex H, and would work with this provider to align our assignments.

### ***Q9***

*ISED is seeking comments on the future demand for C-band in rural and remote areas such as the North, including the following:*

- a) the trend towards using higher frequencies by FSS operations to provide broadband connectivity.*

**DND FSM Answer:** DND has higher frequency operations but does not plan (in short to medium term) to replace our current C-band Fixed Satellite Service sites.

- b) the ability of using higher frequencies to replace current C-band capacity and the potential timelines.*



**DND FSM Answer:** There are propagation and coverage factors in addition to the frequency band which impacts the ability to operate Military Satcom in higher frequencies. DND's transportable terminals are being slowly replaced by Wideband Global Satellite Communications operating in X and Ka-bands but DND's fixed satellite sites will probably remain in C-band for the foreseeable future.

*c) the possibility of a trend towards using 4000-4200 MHz in combination with other connectivity options (e.g. higher frequencies satellites or wireline solutions) and when it would be expected to be available for satellite-dependent areas.*

**DND FSM Answer:** This trend may be both feasible and required as (i) SATCOM technologies such as LEO systems mature and become proven models, and (ii) there is a requirement for additional capacity that cannot be accommodated in the remaining FSS spectrum. DND's service provider Telesat would be primarily responsible for such changes and DND supports Telesat's proposal to follow this trend.

### ***Q23***

*ISED is seeking comments on its proposal to modify the existing FSS satellite authorizations to limit FSS operations in 3700-4000 MHz in non-satellite-dependent areas of Canada to a no-interference basis. ISED is also seeking comments on the proposal to adjust the conditions of licence for FSS operations to reflect the proposals as of the FSS transition deadline, including the possible removal of a high expectation of renewal for the 3700-4000 MHz portion of the band.*

**DND FSM Answer:** Telesat has the contract with DND to provide satellite service using either its own satellites or ones that belong to other service providers. DND agrees with the proposal, for as long as Telesat's intent is to replace the FSS capacity at 111.1W (F2) and 118W (F3) with new capacity in the 4000-4200 MHz band prior to satellite EOL.

### ***Q24***

*ISED is seeking comments on its proposed date of December 2023 as the Canadian FSS transition deadline.*

**DND FSM Answer:** DND has no comments regarding transition deadline. In general, DND is in favor of the Telesat's proposal at Annex H.

### ***Q25***

*ISED is seeking comments on how the U.S. transition will impact the availability of FSS capacity in Canada.*

**DND FSM Answer:** DND (as well as the CBC) rely on US provided FSS capacity. The DND High Arctic Data Communications System must be moved to protected FSS spectrum, or protected via license coordination. The High Arctic Data Communications System currently also operates on Intelsat Galaxy G3C, a non-Canadian C-band service provider and this service



is primed by Telesat. Not sure if Telesat would be responsible for the migration costs for this part of the service.

**Q28**

*ISED is seeking comments on making amendments to the relevant conditions of licence and technical rules in the 3700-4200 MHz band as well as the 3450-3700 MHz band in order to implement the following proposals with respect to protection from interference:*

*c) **after the transition deadline**, FSS earth stations would only be licensed to operate in the 4000-4200 MHz band in **non-satellite-dependent areas** and would be protected from flexible use operations in the adjacent 3700-3980 MHz band*

**DND FSM Answer:** DND is in favor of the Telesat Proposal at Annex H.

**Q40**

*ISED is seeking comments on its proposal to no longer issue new licences for fixed services to operate fixed point-to-point applications in the 3700-4000 MHz band.*

**DND FSM Answer:** DND has one Point-to-Multipoint system for Defence Research and Development Canada in Suffield AB. DND has no issues in no longer issuing licences in 3700-4000 MHz.

**Q41**

*ISED is seeking comments on whether to allow new licences for fixed services to operate fixed point-to-point applications in the 4000-4200 MHz band.*

**DND FSM Answer:** DND is of the opinion that allowing more FS in 4000-4200 MHz would make it more difficult for our C-band Transportable FS Terminals to pass successful coordination with FS systems. These capabilities are typically requested to deploy anywhere in Canada on short notice. Lack of available FSS capacity might also become an issue. DND has the ability to source Ku band kit for their new multiband terminals. If Telesat's proposal is accepted, Telesat should provide these kits to DND as an alternative to C-band for domestic deployments.

**Q42**

*ISED is seeking comments on the proposal to grandfather existing point-to-point operations in the 3700-4000 MHz band under existing licenses for fixed service (as identified in annex A), such that flexible use systems in these two tiers may not claim protection from, nor cause interference to these fixed service stations.*

**DND FSM Answer:** DND agrees with grandfathering of existing systems. DND has one Point-to-Multipoint system in Suffield AB. Our licence 01077429-001 would have to be added to the list at Annex A of this consultation to ensure our data is captured for future deployment coordination with mixed services.



**Q48**

*For FSS earth stations licensed in the 4000-4200 MHz band and flexible use in the 3800 MHz band, in all areas: ISED is seeking comments on adjacent band coexistence measures, taking into account the coexistence measures adopted by the EU (i.e. a stringent OOB limit) and the U.S. (i.e. a combination of guard band, a typical OOB limit, pfd limits, and baseline minimum filter specifications for earth station operations) and the current Canadian requirements (i.e. a typical OOB limit and coordination distance):*

- a) What are the benefits and technical limitations associated with the above coexistence measures?*
- b) Which set of coexistence measures above (i.e. EU, U.S., Canada) is preferred? If applicable, comments are sought on the values of the limits in relation to the supported measures.*
- c) Given the proposal in section 9.1 to displace WBS in 3650-3700 MHz and identify 3900-3980 MHz for shared use, are there any additional considerations that may impact the response to a) and b) above?*
- d) Which portion of the 3800 MHz band should the above measures be applied to in order to protect FSS in the 4000-4200 MHz band (i.e. how many frequency blocks or MHz)?*

**DND FSM Answer:** DND prefers the FCC/Guard band solution.

**Q49**

*ISED is seeking comments on what technical requirements should be imposed to ensure co-channel protection of FSS earth stations from flexible use systems, in the relevant scenarios and timeline as stated in sections 9.5 and 9.6. For example, could the pfd limit of -124 dBW/m<sup>2</sup>/MHz measured at the earth station antenna proposed by FCC above be used to protect co-channel FSS earth station? Alternatively, should other measures be adopted, such as a separation distance as described in section 7.3? Or should a combination of measures be adopted? If applicable, what are the specific values that should be adopted?*

**DND FSM Answer:** DND prefers the -124 dBW/m<sup>2</sup>/MHz limit at the earth station antenna until our operations are moved above 4000 MHz.

**Q50**

*ISED is seeking comments on whether the assumptions made by the FCC about earth stations, including baseline minimum filter specifications for earth station operations as stated above, are applicable to Canadian operations. Is there any additional information that ISED should consider in the development of appropriate technical rules to enable coexistence both co-channel and in adjacent bands?*

*In providing comments, respondents are requested to include supporting technical arguments and rationale.*

*In providing comments to Q46-Q49, respondents are requested to consider the coordination burdens such coexistence and protection measures could impose on either flexible use services or FSS earth stations.*

**DND FSM Answer:** DND is already using the assumptions made by the FCC in an agreement made with Terrestar to protect our Earth Station at Shirley's Bay. The 2300 MHz band is already using the -124 dBW/m<sup>2</sup>/MHz limit. We believe that the same limit could apply for co-channel



assignments in 3700-4000 MHz until our operations are all above 4000 MHz. Including the proposal of a 20 MHz guard band in 3980-4000 MHz.

**Q51**

*ISED is seeking comments on its proposal to not implement any technical requirements for the coexistence between flexible use operation in the 3650-3980 MHz band and radionavigation operations in the 4200-4400 MHz band, noting the 220 MHz frequency separation between the bands of operation. If this is not sufficient for coexistence, what other measures would be appropriate?*

**DND FSM Answer:** DND has not conducted any detailed studies to provide recommendation on technical requirements for co-existence between flexible use and radio navigation operations. However, DND presently use BP filters with several satellite terminals, primarily those on approaches to airports such as Ottawa. New BP filters installed for future 5G terrestrial rejection should include the 4200 MHz BP filter to reject altimeters.

**Q53**

*ISED is seeking general comments on the proposal submitted by Telesat found in Annex H, including whether such an approach would be in the best interest of Canadians and more specifically, whether it would result in the faster deployment of 5G services in the affected frequencies; more efficient use of spectrum and what the implications of this repurposing plan would be for other users of the band.*

**DND FSM Answer:** DND supports the Telesat Proposal at Annex H, as long as DND is assured continued service for our rural (or isolated) and urban stations. Telesat provided verbal assurances that DND's Satcom services in isolated/rural and urban areas would continue. Telesat has also agreed to cover the cost of any system modifications. DND is unable to comment with authority on the impact of Telesat's proposal on deployment of 5G services, bandwidth efficiency and impact on other users. Telesat's proposal is in the best interest of DND, however the commercial value of the spectrum sale will determine if it is in the best interests of Canada. Telesat was perhaps not clear on continuing to support C-band FSS beyond the life expectancy of their existing satellites.

**Q54**

*ISED is seeking comments on whether the Telesat proposal meets ISED's policy objectives outlined in section 3, including:*

- a) supporting rural/remote connectivity*
- b) promoting competition in mobile services*
- c) making more mid-band spectrum available to support 5G services*

**DND FSM Answer:** DND is in favor of the Telesat Proposal at Annex H.

- a) Telesat's proposal will be expected to fund its future LEO satellite constellation. When operational, this satellite constellation will improve connectivity to rural/remote sites. DND



sites in the far North will benefit from LEO satellite constellation when this technology is mature.

- b) DND has no comments.
- c) DND has no comments.

**Note:** DND is not in a position to provide in-depth analysis on Telesat's proposal except in areas where it impacts DND's operations.

### **Q55**

*ISED is seeking comments on what elements from sections 7 to 10 of this consultation would still apply or need to change if ISED were to implement the Telesat proposal, in particular:*

- a) the proposal for maintaining the primary allocation for FSS in the 3700-4200 MHz band*
- b) the proposed implementation of an exemption to transition for satellite-dependent communities and the proposed changes to satellite licenses to apply it*
- c) the proposal for treatment of WBS incumbents*
- d) the proposal to issue interim authorizations for certain existing licence-exempt earth stations in the 3700-4200 MHz band*
- e) technical considerations for coexistence between FSS and flexible use*
- f) technical considerations for coexistence between FSS and aeronautical radio navigation systems*

**DND FSM Answer:** DND does not have the expertise to comment on the changes required in section 7-10 of the consultation except on the use of BP filters on satellite earth terminals to provide frequency rejection at 4200 MHz (altimeter). However, DND believes that Telesat proposal if implemented, would not have any lasting adverse impact (that which cannot be remedied) to existing services.

- g) the overall impact on existing users in the 3700-4200 MHz band

**DND FSM Answer:** DND should have protection for services relocated to the 4000-4200 MHz band, otherwise protection must be from frequency coordination, primarily in the Ottawa and North Bay zones. Telesat has assured DND continued satellite service for our rural (or isolated) and urban stations. DND supports Telesat proposal.

### **Q56**

*If ISED were to implement the Telesat proposal, ISED would need to consider the licensing framework for the 3700-3900 MHz band. Thus, ISED is seeking comments on:*

- a) whether it should, as proposed by Telesat, issue flexible licences in the 3700-3900 MHz band using the same conditions of licence as those contained in annex H of the 3500 MHz Framework, noting that some conditions may need to be adjusted to reflect the differences in the two bands and the decisions resulting from this consultation process*
- b) whether it should issue a single Tier 1 flexible use licence as proposed by Telesat or align with the 3500 MHz band and issue Tier 4 licences*
- c) what deployment conditions should apply to these licences including Telesat's proposal that the deployment requirements would only come into force after the Minister approves a transfer*
- d) any additional conditions of licence that should apply given the nature of the proposal*





**DND FSM Answer:**

- a) DND is in favor of implementing Telesat's Proposal at Annex H.
- b) DND supports issuing Tier 1 licence to Telesat since it would allow cost covering of equipment changes to end users impacted by the band re-allocation. Telesat would also be responsible to coordinate changes with the users to ensure uninterrupted service. Tier 1 licence will also allow the funding of LEO satellite constellation. Minimum financial impact to DND.
- c) DND has no comments.
- d) DND has no comments.

***Q58***

*ISED is seeking comments on Telesat's proposals for the transition of FSS earth stations and whether any additional measures are required to ensure a smooth transition.*

**DND FSM Answer:** DND prefers a written commitment from Telesat to cover all cost incurred by the end users (customer) and provide required support and coordination during the proposed transition. In addition, Telesat should engage in early consultation regarding their plan to allow DND time to review remote location access logistics. DND supports the proposal from Telesat.

***Q59***

*Telesat's proposal includes ISED allocating an additional 80 MHz for flexible use in the 4000-4100 MHz band. ISED is seeking comments on the feasibility of making this extra spectrum available, specifically:*

- a) whether there would be standardized 5G equipment available for this 80 MHz, given that it does not align with the U.S. band plan*
- b) whether there would be FSS filters available, given the reduced amount of FSS spectrum and that it would not align with the U.S. band plan*
- c) whether there would be enough capacity to continue FSS services in Canada with the proposal to reduce the amount of FSS spectrum to 100 MHz*
- d) to what degree would the requirement to protect U.S. FSS earth stations in the border areas have an impact on the ability to deploy flexible use stations near the border and to what degree would this impact the value of this spectrum*

**DND FSM Answer:**

- a) DND has no comments.
- b) There are commercial ventures able to supply filters for specific bands. Filters with better rejection specifications have higher insertion loss. Any loss in between the LNB and the feed affects the antenna G/T, which effectively reduces the gain of the antenna. Since DND's



antennas where the 5G networks will be rolled out are much larger than they typically need to be, the impact of the additional insertion loss will be very minimal.

- c) DND is concerned about packing C-band Satcom links within a 100 MHz bandwidth (4000-4100 MHz) especially in urban/metro areas which are likely to have 5G services. Preference would be to be located at the top of the band. Of note, while there may be sufficient capacity to continue FSS services, the ability to expand existing service capacity will be capped. DND will have agreement with Telesat on how this packing will be done. DND has been assured by Telesat for a smooth transition and continuation of services.
- d) Additional frequency coordination would be required depending on the location and direction. No comment on the spectrum valuation.