

Canadian Electricity Association Association canadienne de l'électricité

Presentation to CRTC Public Hearing
Item 38
Friday, 28 February 2020

Intervener #456 in the matter of:

Review of mobile wireless services,
Telecom Notice of Consultation CRTC 2019-57,
28 February 2019

Outaouais Hearing Room
Conference Centre
Portage IV
140 Promenade du Portage
Gatineau (Québec)

Please check against delivery.

Review of mobile wireless services, Telecom Notice of Consultation CRTC 2019-57, 28 February 2019

Outaouais Hearing Room, Conference Centre, Portage IV, 140 Promenade du Portage, Gatineau
 Friday, 28 February 2020

Panel:

38. Canadian Electricity Association (int. #456)

Audience							
Alex Kent Advisor, Transmission & Distribution Policy CEA	SARAH ROBINSON Director, Communications & Marketing CEA	Barmak Khosravi Chargé d'équipe, Architecture de solutions de télécommunications Hydro-Québec	Sol Lancashire Manager, Telecom Engineering B.C. Hydro	Francis Bradley Chief Executive Officer CEA	Sylvain Riendeau Chargé de programme d'innovation Institut de recherche Hydro-Québec	Charles Berndt Manager, Grid Technology Hydro Ottawa	Bram Abramson Outside Advisor to the CEA
Comité d'audition							

[FRANCIS BRADLEY, President & CEO:]

PR1. Merci, Madame la Secrétaire d'audience, et bon matin. Mon nom est Francis Bradley, Président et directeur-général de l'Association canadienne de l'électricité. Effectivement, je demanderai aux membres du panel de se présenter avant notre présentation ce matin.

[ALEX KENT, Advisor—Transmission & Distribution Policy, Canadian Electricity Association]

PR2. My name is Alex Kent. I am a Transmission & Distribution Policy Advisor at CEA. My work includes supporting the CEA Telecom Committee.

[SARAH ROBINSON, Director—Communications & Marketing, Canadian Electricity Association]

PR3. My name Sarah Robinson. I am Director of Communications & Marketing at CEA..

[BARMAK KHOSRAVI, Chargé d'équipe—Architecture de solutions de télécommunications, Hydro-Québec]

PR4. Mon nom est Barmak Khosravi. Je suis ingénieur en télécommunications dans l'unité Architecture de solutions de télécommunications chez Hydro-Québec. Je siège sur le Comité des technologies et télécommunications opérationnelles de l'Association canadienne de l'électricité.

[SOL LANCASHIRE, Manager—Telecom Engineering, B.C. Hydro]

PR5. My name is Sol Lancashire. I manage telecommunications engineering at B.C. Hydro. Nationally, I am Chair of the CEA's Operational Technology & Telecommunications or, for short, Telecom Committee.

[SYLVAIN RIENDEAU, Chargé de programme d'innovation—Institut de recherche, Hydro-Québec]

PR6. Sylvain Riendeau, Membre du Comité des télécoms de l'ACE, et Chargé de programme d'innovation à l'Institut de recherche d'Hydro-Québec.

[CHARLES BERNDT, Manager—Grid Technology, Hydro Ottawa]

PR7. Charles Berndt, Manager of Grid Technology at Hydro Ottawa across the river, and Vice-Chair of the CEA's Telecom Committee.

[BRAM ABRAMSON, Outside Advisor to the CEA]

PR8. Bram Abramson, outside advisor to the CEA.

[FRANCIS BRADLEY]

PR9. Thank you.

1. Distinguished Commission -- our request in this proceeding is focused. We ask that you direct the Canadian Steering Committee on Numbering to amend the Canadian IMSI Assignment Guideline to allow Critical Infrastructure Operators to acquire MNCs.
2. The Critical Infrastructure sectors that have had an interest in this hearing have demonstrated a substantial need whose fulfilment will allow continued innovation in electricity grids -- advancing the social and economic fabric in all regions of Canada. But providing for MNC access also substantially advance the basic telecom policy objectives you seek to fulfil.

[SARAH ROBINSON:]

3. Members of the CEA employ more than 2000 Canadians in telecommunications roles. Our networks span tens of thousands of route-kilometres of fibre, and tens of thousands more on wireless backhaul links.
4. These networks connect more than 12 million endpoints, each with a unique identifier. We have a long history of connecting remote devices to monitor and control the electrical grid. Think of us as the original Internet of Things operators.
5. Our members run research labs, design telecom solutions, and deploy telecom networks to connect devices at scale. We have been doing it for decades. But our sector's traditional business models are evolving in a way that engages both electricity and telecom. Distribution grids are getting smarter.

[CHARLES BERNDT:]

6. Like the railways you heard from last week, telecom isn't an external functionality we can outsource. It's core to what we do. We run intertwined power and telecom networks that meet stiff security standards to enhance power grid resiliency and efficiency.
7. But those grids are evolving into smart grids. Think of onboard devices that poll each other about what's needed where, and in an outage, act accordingly.
8. Even at a smaller electrical utility like Hydro Ottawa, generation and consumption are starting to take place throughout the network, in both directions. That's what's needed to integrate better resiliency and fault tolerance, and more distributed energy resources like solar panels.
9. Different telecom-operating CIOs face different geographies, resiliency and cybersecurity standards, customer bases, and therefore different network and operating models. But all of us are completely aligned in the following. We must continue to route our own traffic. MNC access is the only way to do that.
10. Full MVNOs have had such access since 2015.
11. The Public Safety Broadband Network has such access.

12. But the Critical Infrastructure Operators with some of Canada's most extensive telecom networks do not. Critical infrastructure operators cannot interconnect core-to-core without it. Without MNCs, we cannot sit down with Mobile Network Operators to negotiate in a way that lets us meet our obligations.

[SYLVAIN RIENDEAU:]

13. Quand nous parlons d'innovation, cela signifie travailler dans des laboratoires de recherche, comme je le fais à Hydro-Québec. Nous continuons d'innover en créant des modèles d'exploitation pour une vaste gamme d'appareils connectés, tels que les topologies hautement maillées et auto-réparatrices par lesquelles nos millions de terminaux s'engagent les uns avec les autres, plutôt que de devoir téléphoner à chaque fois à un opérateur central.
14. Il y a plus de sept ans, j'ai co-rédigé un article de l'IEEE décrivant le modèle « PVNO ».
15. Pour être clair, un « PVNO » est simplement un modèle permettant de relier plusieurs RANs de type LTE ou 5G, par exemple – qu'ils proviennent d'un opérateur sans fil traditionnel, ou du Réseau à large bande de sécurité publique, ou d'un autre partenaire --- en un réseau maillé et agrégé, identifié sous un MNC et distinct de chacun des réseaux en amont dont il dépend.
16. Le chemin qui mène du concept à la Demande de Partie I de l'ACÉ sur le PVNO, en 2018, a ainsi été l'objet de recherches approfondies. Nos secteurs ont confiance en cette demande concrète qui est davantage qu'une simple vision. Les membres de l'ACÉ qui gèrent des réseaux de télécommunications se procurent de la connectivité, qu'elle soit auprès des trois grands opérateurs de téléphonie mobile, de satellites comme Télésat, ou bien de partenaires plus spécialisés comme Tamaani Internet au Nunavik, Entel dans le territoire Nisga'a, ou bien ABC Allen Communications, également en Colombie-Britannique.

[SOL LANCASHIRE:]

17. And when we talk about cybersecurity, we mean well-specified standards coordinated by the North American Electric Reliability Corporation. Our members' telecom networks must meet these "NERC" standards, regardless of cost. The responsibility cannot be outsourced. In our British Columbia PVNO testbed, for instance, integrating NERC compliance is a key part of the case we are proving out.
18. By the way, you'll notice in our second attachment that that testbed has three MNCs assigned to it. Testbeds are able to get MNCs. But they're needed post-testbed, too. Cybersecurity is not a reason for us to outsource to a telco: it's one of the reasons we *can't* outsource. With an MNC, on the other hand, it means that we can procure connectivity, in bulk, from multiple carriers, while maintaining responsibility for standards compliance internally.
19. CEA members have been sharing information about cyber threats with what is now the Canadian Centre for Cyber Security for more than four years. Running highly secure telecom networks is the job of every CEA member.

[BARMAK KHOSRAVI:]

20. Il a été question dans cette instance de l'attribution précise des MNC : par exemple, s'il faut attribuer un bloc d'MNCs à deux chiffres par opérateur d'infrastructures critiques (« CIO »), ou par secteur, ou bien en associer un seul à l'ensemble des opérateurs d'infrastructures critiques.
21. Nous sommes d'accord avec l'Association des chemins de fer du Canada que l'allocation plus granulaires se traduirait par plus de simplicité opérationnelle. Nous convenons également que l'utilisation efficace de cette ressource limitée est essentielle. C'est pourquoi nous privilégions ici l'accès aux MNC pour les opérateurs d'infrastructures critiques qui exploitent un réseau de télécommunication d'envergure.
22. Nous sommes donc ouverts à une formulation restrictive. Cet accès pourrait, par exemple, cibler les opérateurs d'infrastructures critiques dont les réseaux de télécommunication dépassent un certain seuil d'appareils communicants, ou de kilomètres de fibre, de territoire couvert, ou de tout autre critère jugé approprié par le Comité directeur canadien de la numérotation, ou CSCN. Mais nous convenons également avec le RAC que la délégation au CSCN est la meilleure approche ici. Pour illustrer ce point, nous avons joint à notre présentation trois documents :
 - l'extrait pertinent de votre décision de 2015, et une approche semblable que vous pourriez adopter en relation avec la présente demande ;
 - une liste récente de l'allocation des MNC au Canada,
 - et une activité en cours du CSCN en lien avec l'utilisation des MNC.

[FRANCIS BRADLEY:]

23. There has been a fair bit of talk about threats at this proceeding. We are trying to change the channel for a minute to present an opportunity. We are not here to ask for special tariffs, or exemptions, or heavy-handed intervention. We only have one request, it is simple, and will help unlock competitive telecom market forces to best serve Canadians.
24. It is time critical infrastructure operators were able be able to move forward with creating MNC-numbered networks. Lowering the cost of rural and remote connectivity, and fuelling the competitive intensity of Canadian wireless telecom, are opportunities worth seizing.
25. We'd be glad to respond to any questions you may have.

Attachment 1 (of 3): Telecom Regulatory Policy CRTC 2015-177

The following four paragraphs are excerpted from Regulatory framework for wholesale mobile wireless services, Telecom Regulatory Policy CRTC 2015-177, 5 May 2015.

Regulatory measures with respect to wholesale MVNO access

Acquisition of mobile network codes by full MVNOs

159. Mobile network codes (MNCs)³³ in Canada are assigned by the Canadian Numbering Administrator pursuant to the Canadian International Mobile Subscriber Identity (IMSI) Guideline (the Guideline). The Guideline was developed by the Canadian Steering Committee on Numbering (CSCN)³⁴ and approved by the Commission.³⁵ The Guideline requires that an applicant for an MNC hold a spectrum licence from Industry Canada. Thus, MVNOs cannot acquire MNCs.

160. CNOC, Cogeco, Lycamobile, and Orange submitted that full MVNOs should be permitted to acquire their own MNCs, which would enable them to provision their own IMSI numbers. Cogeco submitted that allowing full MVNOs to acquire their own MNCs is critical to ensuring that a full MVNO can operate in the retail market independently of its host wireless carrier.

Commission's analysis and determinations

161. The Commission considers that allowing full MVNOs to acquire MNCs would provide MVNOs with a greater level of independence, because they would not have to rely on the host wireless carriers' MNCs and subscriber identification module (SIM) cards. Having its own unique MNC enables a full MVNO to more easily switch its host wireless carrier, make arrangements with multiple wireless carriers, and negotiate its own wholesale roaming arrangements (e.g. with international wireless carriers). The Commission therefore considers that it is appropriate to amend the Guideline to allow for the assignment of MNCs to full MVNOs.

162. The Commission hereby **directs** the CSCN to (i) amend the Guideline to allow full MVNOs to acquire MNCs, and (ii) submit the amended Guideline for Commission approval by **6 July 2015**.

* * *

The following decision fragment is a suggested approach that the CRTC could take in enabling access to Mobile Network Codes by Critical Infrastructure Operators with significant telecom network operations, good reasons to route their own traffic, and the technical expertise and operational scale to do so. It is blacklined against paragraphs 161-162 of the above-cited TNC 2015-177 for illustrative purposes: added text is underlined; ~~deleted text~~ is struck through.

In the CEA's view, this is the only CRTC action required to address the Critical Infrastructure Operator bottleneck referred to in its filings in this proceeding.

Proposed Commission's analysis and determinations

#. The Commission considers that allowing ~~full MVNOs~~Critical Infrastructure Network Operators to acquire MNCs would provide ~~MVNOs~~critical infrastructure operators with a ~~greater level of independence~~the opportunity to continue to innovate and invest in always-on, resilient networks, including in rural and remote areas, because they would not have to rely on the host wireless carriers' MNCs and subscriber identification module (SIM) cards. Having its own unique MNC enables a ~~full MVNO~~Critical Infrastructure Network Operator to more easily switch its host wireless carrier, make arrangements with multiple wireless carriers, and negotiate its own wholesale roaming arrangements (e.g. with international wireless carriers). The Commission therefore considers that it is appropriate to amend the Guideline to allow for the assignment of MNCs to ~~full MVNOs~~Critical Infrastructure Network Operators.

#. The Commission hereby **directs** the CSCN to (i) amend the Guideline to define Critical Infrastructure Network Operators (CINOs) and allow CINOs to acquire MNCs, and (ii) submit the amended Guideline for Commission approval by ~~6 July 2015~~ **● 2020**.

Attachment 2 (of 3)

Select Language ▼



- About CNA ▼
- Numbering ▼
- NPA Relief ▼
- CNA Consortium ▼
- CSCN ▼
- NRUF ▼
- Site Map
- Search Site
- Links

IMSI / MNC Codes

- | [IMSI / MNC Description](#) | [IMSI / MNC Assignment Guideline](#) | [IMSI / MNC Forms](#) | [MNC Status](#) |

IMSI / MNC Description

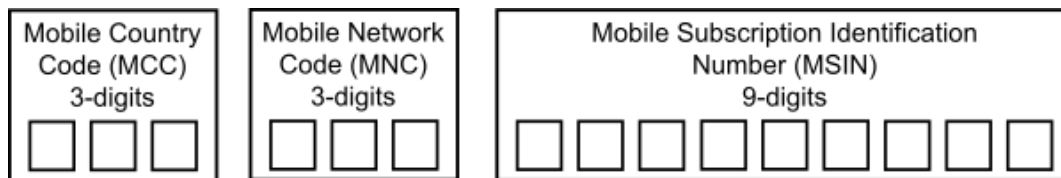
In Canada, the Canadian Numbering Administrator (CNA) undertakes the primary administrative functions for all International Mobile Subscription Identity (IMSI) resources. The CNA administers IMSI resources in accordance with the [Canadian International Mobile Subscription Identity \(IMSI\) Assignment Guideline](#) developed by the Canadian Steering Committee on Numbering (CSCN) and approved by the Canadian Radio-television and Telecommunications Commission (CRTC). The Guideline contains procedures for the assignment and use of IMSIs for Canadian Wireless Service Providers (WSP), Wireless Competitive Local Exchange Carriers (WCLEC), Full Mobile Virtual Network Operators (Full MVNO) and satellite carriers.

The administration of IMSIs in Canada is conducted under the regulatory authority of the CRTC. The IMSI administrator administers only the Mobile Network Code (MNC) segment of the IMSI.

The IMSI format in Canada is a fixed 15-digit length. Each IMSI contains:

- A Mobile Country Code (MCC);
- A Mobile Network Code (MNC); and,
- A Mobile Subscription Identification Number (MSIN)

The format of the IMSI in North America is:



The MCC and MNC combine to form the Home Network Identity (HNI).

The MNC and MSIN together form the National Mobile Subscription Identity (NMSI). MSINs are administered directly by the wireless network operator to whom the MNC is assigned.

[Back to Top](#)

IMSI / MNC Assignment Guideline

The [Canadian International Mobile Subscription Identity \(IMSI\) Assignment Guideline](#) developed by the Canadian Steering Committee on Numbering (CSCN) and approved by the Canadian Radio-television and Telecommunications

Commission (CRTC) may be found on the CRTC website through the following Guideline and Numbering Links page:

- [Canadian International Mobile Subscription Identity \(IMSI\) Assignment Guideline](#)

[Back to Top](#)

IMSI / MNC Forms

The Mobile Network Code (MNC) Application, Reservation, Information Change or Return form (Form A) and other forms are located in Appendix 2 of the [Canadian International Mobile Subscription Identity \(IMSI\) Assignment Guideline](#), which is located on the CRTC website.

Those meeting the requirements to apply for an MNC should extract the form from the guideline for submission to the IMSI administrator and submit them to NonCOCCodeApps@cnac.ca.

- [Canadian International Mobile Subscription Identity \(IMSI\) Assignment Guideline](#)

[Back to Top](#)

MNC Status

The currently assigned MNCs in Canada are listed below.

MNC	Company	Remarks
100	Data on Tap Inc.	DBA dotmobile
130	Xplornet Communications Inc.	
131	Xplornet Communications Inc.	
150	Cogeco Connexion Inc.	
220	Telus Mobility	
221	Telus Mobility	
222	Telus Mobility	
250	ALO Mobile Inc.	
270	Bragg Communications	
290	Airtel Wireless	
300	ECOTEL Inc.	
310	ECOTEL Inc.	
320	Rogers Communications Canada Inc.	
330	Blue Canada Wireless Inc.	
340	Execulink	
360	Telus Mobility	
370	Microcell	
380	Keewaytinook Okimakinak	
420	A.B.C. Allen Business Communications Ltd.	
480	SSi Micro Ltd.	

490	Freedom Mobile Inc.	Formerly Wind Mobile Corp.
491	Freedom Mobile Inc.	
500	Videotron Ltd.	
510	Videotron Ltd.	
520	Videotron Ltd.	
530	Keewatinook Okimakinak	
540	Rovvr Communications Inc.	
550	Star Solutions International Inc.	
560	Lynx Mobility	
570	LightSquared	
590	Quadro Communication	
600	Iristel Inc.	
610	Bell Mobility	
620	Ice Wireless	
630	Bell Mobility Aliant	
640	Bell Mobility	
650	Tbaytel Mobility	
660	MTS Mobility	
670	CityTel Mobility	
680	SaskTel Mobility	
690	Bell Mobility	
710	Globalstar	
720	Rogers Communications Canada Inc. (Wireless)	
721	Rogers Communications Canada Inc. (Wireless)	
730	TerreStar Solutions	
740	Shaw Telecom G.P.	
750	Sask Tel Mobility	
760	Telus Mobility	
770	Rural Com	
780	SaskTel Mobility	
790	NetSet Communications	
820	Rogers Communications Canada Inc. (Wireless)	
860	Telus Mobility	
880	Telus/Bell shared	
940	Wightman Telecom	
990	Ericsson Canada Inc.	Experimental Purposes (iaw para 6.8 f) of the Guideline)
991	Halton Regional Police Services	Experimental Purposes (iaw para 6.8 f) of the Guideline)

996	Powertech Labs	Experimental Purposes (iaw para 6.8 f) of the Guideline)
997	Powertech Labs	Experimental Purposes (iaw para 6.8 f) of the Guideline)
998	Powertech Labs	Experimental Purposes (iaw para 6.8 f) of the Guideline)

[Back to Top](#)

Copyright ©1998-2020 Canadian Numbering Administration Consortium, Inc. (CNAC)

2020-02-27 16:30:38 EST



Attachment 3 (of 3)

CRTC INTERCONNECTION STEERING COMMITTEE

TASK INFORMATION FORM

Date Originated: March 6, 2019

Last Date Updated: 15 July 2019

WORKING GROUP: CSCN

TASK #: Proposed TIF 104

File ID: CNTF104A

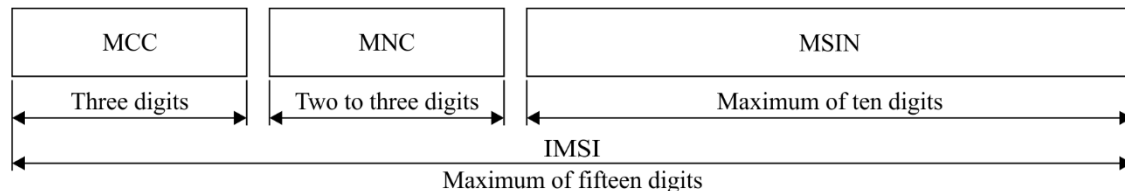
TASK TITLE: Update Canadian International Mobile Subscription Identity ("IMSI") Assignment Guideline

TASK DESCRIPTION:

The current inventory of MNC codes available to mobile wireless carriers in Canada is 100 codes (based on two-digit assignment principles). Of this total there are approximately 50 codes remaining. There is a potential for a rapid increase in demand by various entities such as prospective Full MVNOs and private LTE radio network operators. The purpose of this TIF is to recommend appropriate steps before the industry runs out of suitable Mobile Network Codes (MNCs) available for assignment including to (a) secure resources for the future in assignment of future MCC+MNC combinations used to uniquely identify a mobile wireless carrier and to assign IMSIs to uniquely identify wireless customers, and (b) add monitoring and jeopardy condition procedures to the Canadian IMSI Assignment Guideline.

CRITICAL PATH: N (Y or N)

BACKGROUND:



MCC Mobile country code
MNC Mobile network code
MSIN Mobile subscription identification number
IMSI International mobile subscription identity

E.212(16)_F01

The MCC + MNC combination is integral to unique identification of a carrier in an international roaming context and some legacy public land mobile networks located around the world can only recognize and process the first two digits of a three-digit MNC.

Therefore, Canadian wireless carriers generally prefer that the first two digits of the three-digit MNC not overlap with the first two digits of the MNC assigned to any other Canadian wireless carrier. Thus, in Canada, wireless carriers' initial MNCs are assigned in the format XX0, and there are only 100 such MNCs associated with Canada's current and only MCC. To date, approximately 50% of the available XX0 MNCs associated with Canada's Mobile Country Code ("MCC") 302 have been assigned.

A national numbering plan administrator may request the assignment of an additional MCC in writing to the ITU-T Director of the Telecommunication Service Bureau ("TSB") as set out in

Appendix C, "Procedures for the assignment of an additional MCC to a country" in Recommendation ITU-T E.212. When a country has less than 30% of the MNC resource available, the national numbering plan administrator is encouraged to provide information about its present usage and assignments of MNCs to the Director of TSB. A national numbering plan administrator may apply for a subsequent MCC when an existing MCC is approaching exhaustion. Exhaustion is defined as having less than 20% of the MNC resource available within an MCC.