Comments on the Implementation of Emergency Alerting Broadcasts

by
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1. Introduction

Now that all the submissions filed with respect to CRTC Broadcasting Notice of Consultation 2014-85[1] have been made public, it seems quite clear that the Commission's overall plan to require Canadian OTA broadcasters and BDUs to deliver qualifying emergency alerting messages to the public by 31 December 2014 has quite a number of associated practical problems.

Most of the issues identified by the public intervenors are not new. They were recognized much earlier by broadcasters and BDUs, especially those who served on the government/industry Common Look and Feel Working Group (CLFWG)[2]. Virtually all of them were discussed at great length during numerous CLFWG meetings and other industry seminars. Unfortunately, the CRTC chose not to participate in the CLFWG's work, where it could have obtained a better understanding of the basic practicalities associated with undertaking such a complex task. This has resulted in proposed regulations which, in a number of crucial respects, will be impossible to follow. As a consequence, the CRTC is now faced with the inevitability of wide-spread non-compliance, should the proposed regulations come into force as scheduled. If this happens, there will be no winners, least of all the public who will have been expecting to see a National Public Warning System (NPAS) that actually works as advertised.

The regulations for radio and TV licensees that the CRTC has proposed in BNC CRTC 2014-85 are very clear on the primary issue - that of making mandatory the delivery of qualifying alerting messages via broadcasting stations. However, the Commission has swept aside concerns that the industry previously expressed about the practicability of complying with a set of vague and imprecise regulations, such as those proposed. Under the voluntary implementation scheme that the CRTC had previously endorsed, there was a reasonable amount of flexibility for licensees to do whatever is necessary, in an operational sense, to "get the job done". The voluntary condition-of-licence option that was used with the CBC could equally have been applied to the private sector, if the CRTC were worried about foot-dragging by the industry. Under a mandatory regime which employs imprecise and confusing regulations, such as those proposed, licensees can never be certain that they will not be penalized later when they make rule interpretations that they believe are necessary in order to achieve the main objective that the regulation is supposed to foster in the first place; that is, the carriage of qualifying emergency alerts in a responsive and responsible manner.

The following sections of this report highlight the major difficulties identified with the Commission's current mandatory alerting plan, as noted by many industry intervenors. A few additional considerations are also raised, where these relate to the issues being discussed.

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[1] See: https://services.crtc.gc.ca/pub/instances-proceedings/Default-Defaut.aspx?S=C&PA=B&PT=NC&PST=A&Lang=eng

[2] The CLFWG reports to the Federal/Provincial/Territorial (FPT) Public Alerting Working Group, which was created by the Senior Officials Responsible for Emergency Management (SOREM).

2. Compliance with Common Look and Feel Guidelines

The proposed CRTC regulations state that broadcasters must ensure that all the qualifying alerting messages that they transmit are in conformity with the Common Look and Feel operating guidelines document, *National Public Alerting System: Common Look and Feel Guidance 1.0*[3]

When the CLFWG prepared this document it was assumed that it would be just that - (i.e.) guidelines for message originators, broadcasters and the NAADS, all operating under a voluntary participation regime. Stating in regulations that guidelines must be followed removes any flexibility that licensees may have had to do things any other way, even when this is necessary in order to properly carry out the intended task.

Broadcasters will be unable to ensure that all aspects of the CLF guidelines will be reflected within the alerts they carry because some of these must be implemented by the message originators and/or by the operator of the National Alert Aggregation and Dissemination System (NAADS) i.e. Pelmorex Communications Inc. Moreover, making mandatory the observance of guidelines means that they are no longer what they were originally intended to be; rather, they become rigid instruments that will prove very difficult to modify at a later date.

My conclusion: Practically speaking, broadcasters should only be held responsible for those elements of the CLF guidelines that they are able to control, which principally will be the provisions respecting the way messages should appear and sound to the public, as well as the timeliness of their transmission.

3. Scope of the mandatory requirement for universal carriage

The CRTC has worded its proposed alerting regulations in a manner that make them universally applicable to all its OTA licensees, regardless of market size, financial capacity or the technical capabilities of the broadcasters. While the receiver/decoder/inserters and peripheral equipment required to air NAADS alerts on large commercial stations may only be a relatively minor additional capital cost element for these licensees, that will not be the case for smaller commercial operators, as well as campus, community and ethnic stations.

- **Alerting implementation requires more than just a simple "black box" installation**

  Whenever a regulation must be met, broadcasters need to ensure that the equipment that achieves compliance is both robust and reliable. This suggests that the usual back-up measures such as hot stand-bys for alerting receivers/decoders/inserters may be required. Likewise, this equipment may need to be factored into the design of a station's UPS facilities, since life-threatening emergency events often result in power failures.

  There is also a ricochet effect on other operational and regulatory requirements when a licensee sets up an internal technical system that will automatically interrupt regular programming and insert new content over which it has no control. Traffic management and logging equipment, as well as any program automation hardware and software, will need to be modified to ensure that these special and unpredictable inserts are properly recorded and logged. This will require both hardware and software modifications for existing systems.

[3] See http://cradpdf.drdc.gc.ca/PDFS/unc129/p538116_A1b.pdf for a copy of this document, which is published by the Centre for Security Science at Defence Research and Development Canada (DRDC), not by CAPAN as stated in the draft CRTC regulations.

As the implementation of alerting will be far more complicated than simply installing "black-box" receiver/decoder/inserters at each originating station, many of the Commission's licensees will not have the financial capability or the internal technical resources to do this by 31 December 2014.

My conclusion: Because of this, the implementation of broadcast alerting needs to be phased in over time, starting with the major markets and moving later to medium and smaller markets.

- **Rebroadcasters present a unique difficulty**

Arranging to carry unique alerting messages can become a very costly undertaking at rebroadcasting transmitter sites that currently employ satellite or off-air VHF/UHF feeds to deliver content that is 100% identical to that of the originating station. If this regulatory requirement is confirmed, it would mean that licensees would need to have an independent means of inserting separate baseband audio (and possibly video) messages that may arrive unannounced at any time. In many cases, it will not be practical to set up a dedicated new program feeder link from the originating station to each rebroadcast site. The best that broadcasters may be able to achieve is to install an alerting receiver/decoder at each rebroadcasting site, so that it can cut away from the original programming and insert the required alert when necessary. However, this will create the following challenges for licensees:

- Obtaining alerts in real time from the NAADS requires either a high-speed internet connection or a TVRO capable of receiving the satellites used by the Pelmorex Weather Network. The former is unfeasible at many rural rebroadcasting sites at this time, while the latter will be cost-prohibitive, with a capital requirement that may well exceed the cost of the original rebroadcaster installation.
- Power availability is often limited at small and remote transmitter sites, making it costly to add extra equipment that must be powered at all times (and which may also require hot stand-bys for reliability purposes).
- The content of 100% rebroadcasters is not logged separately at present, since it is assumed that it is exactly the same as that of the originating station, which is being logged and recorded elsewhere. If separate content (i.e. an alert) is to be transmitted occasionally, the CRTC logging rules will still apply to each transmitter, so new logging equipment (both alphanumeric and audio) will be required at each site where the content may be modified.

Airing alerts that do not necessarily pertain to the specific coverage area of a given transmitter will not compromise public safety in any way. The worst that will occur is that the alert may annoy some listeners/viewers to whom it does not apply because it interrupts their enjoyment of a program. CRTC insistence on anything more than this will likely result in licensees terminating many small rebroadcasters because the cost of compliance will be prohibitive.

My conclusion: For valid practical reasons, licensees need to be allowed to carry, on all their interconnected rebroadcasting transmitters, alerts that may only be relevant to specific segments of their overall service areas.

4. Audio issues

The proposed alerting regulations relating to OTA radio services say that each licensee must implement a public alerting system that *"immediately broadcasts on a given station any audio alert that it receives from the National Alert Aggregation and Dissemination System"* (emphasis added). This is an example of a vague regulation that will inevitably foster uncertainty and confusion within the industry. When broadcasters see the word "audio" they take it to mean either live audio or else an ephemeral recording, using a conventional format such as an MP3, delivered via some form of telecommunication.

However, the NAADS system will not deliver "audio" in the conventional sense because it cannot handle file attachments or live streaming of audio. If the originator has provided the NAADS with an audio file containing its alerting message, the NAADS will re-code this audio into Base64 alpha-numeric text, which will then be embedded within the overall CAP-CP message content sent to last-mile distributors (LMD). This data can then be decoded into an audio file at each LMD site and subsequently broadcast. Moreover, the NAADS may transmit a URL within its CAP-CP message that points to an internet server from which an MP3 audio file can be downloaded for broadcast.

The main difficulty for broadcasters will arise when the originator does not provide an audio file version of its alert, either directly to the NAADS or else on an internet server to which the NAADS message can point. If the originator provides only an alpha-numeric text version of its alert, radio broadcasters will have no audio file to broadcast. Considering the current wording of the CRTC regulations, it would appear that no alert transmission would in fact be required, since no "audio" alert has been "received" via the NAADS.

Nevertheless, the reality is that most broadcasters are responsible licensees that care about their communities. If no audio is delivered to them, most would likely choose to have their on-air staff read text-only messages directly to air, whenever this is feasible. Alternatively, alerting receiver/decoders are capable of creating audio from text-only files using native text-to-speech (TTS) software. The problem is that some TTS systems have a great deal of difficulty pronouncing certain place names so that they can be readily understood by local residents. This is especially a problem for French place names in English Canada and vice-versa, as well as with the names of some First Nations communities. Modifying the lexicon in TTS software to achieve correct pronunciation and cadence in the artificial speech is a tedious manual process. Individual broadcasters choosing this alternative would be obliged to perform this task at each alerting receiver/decoder location within their system.

Given this, the option for producing TTS audio when no audio file is available is really only a practical alternative when an entire provincial or regional warning system is designed for this (e.g. Alberta). In such cases, the TTS lexicon can be managed centrally and the audio on all stations carrying alerts will sound exactly the same. Where a central approach is not employed, difficulties will occur due to the fact that individual LMDs in the same market will be deciding which equipment and software to employ and how (or even whether) to customize the TTS lexicon to account for local needs. This has the potential to produce a hodge-podge of audio messages of varying quality in a given market, thus making a mockery of the objective for a "common look and feel" for emergency alerts.

In the case of the television regulations, there is even more likelihood of confusion on the issue of audio. The draft regulations say that each TV licensee shall broadcast an alert "*…that it receives — in a form <u>including both text and audio content</u> — from the National Alert Aggregation and Dissemination System…"* (emphasis added). This says that LMDs need to obtain both visual and aural components of alerts before broadcasting them. Nevertheless, the *CLF Guidelines* document, which the Commission says broadcasters must follow, allows TV broadcasters to transmit only the visual text, in cases where audio files are not provided by the originator, so long as the Canadian Alerting Attention Signal is transmitted on the audio channel at the same time[4].

My conclusion: <u>When actual audio file versions of alerts are not provided by the originator and delivered by the NAADS, radio broadcasters should be allowed to air an alert when staff are available to read it live-to-air. TV broadcasters should be allowed to do likewise, but could also transmit the visual text message along with</u>

[4] Ref: Section 7.3.15.1.3 of *National Public Alerting System: Common Look and Feel Guidance 1.0*

the Alerting Attention Signal (i.e. a multi-frequency warning tone that tells the visually-impaired that an alert is being broadcast). Both radio and TV broadcasters should be allowed to decide to employ TTS to generate audio from text-only messages; however, this will require careful consideration in view of the quality problems inherent in artificial speech.

5. Geographic coding issues

The proposed regulations say that licensees must broadcast alerts only on transmitters *"that serve the area targeted by the alert".* Broadcasters will need to interpret what is meant by this because the CRTC is vague on what actually constitutes a station's "service" area. This is most likely to be considered the area contained within the official contour map for each station, as approved by the Commission and Industry Canada. But does this mean the interference-free protected contour, where the signal can reliably be received by the public, or does it mean the contour depicting the minimum signal field strength generally considered necessary for reliable service in the absence of interference? What is to be done for AM stations, most of which have substantially different service contours day and night? Will two sets of contours be required, with the equipment switching coverage data references according to the time of day?

What is clear is that each and every alerting receiver/decoder operated by a broadcaster will have to be individually programmed with the Standard Geographic Classification (SGC) codes corresponding to (at least) the Census Divisions (CD) that are contained within the broadcaster's "service area", however that may be defined. If improved granularity is required, then many more codes will need to be entered, possibly down to the Census Subdivision (CSD) level. Census Metropolitan Area (CMA) codes may also be required in some circumstances.

To program this information into receiver/decoders, the sequence of tasks that will have to be performed by each and every transmitter licensee will be as follows:

- Identify the official coverage map to be used as the "service area" reference for each of its transmitters.
- Encode service area maps that are not already in electronic format so that they can be read by Geographic Information System (GIS) software (e.g. MapInfo).
- Obtain GIS-readable SGC data for all CD, CSD and CMA areas that may be covered by licensed transmitters.
- Using GIS software, create a filtered list of SGC codes that are completely or partially enclosed by the service contours for each transmitter.
- Manually program this data into the alerting receiver/decoder associated with the transmitter under consideration.[5]

Throughout the life of the system, the co-related SGC and transmitter service area data will need to be updated whenever transmitter contours change or modifications are made by Statistics Canada to the boundaries defining the census areas.

One can see from the above task list that the set-up and routine maintenance of such systems may be beyond the ability of many broadcasters to carry out on their own, especially the smaller ones with no in-house technical expertise. Annual budgets will have to be adjusted to provide the resources needed to maintain alerting systems in proper form, as operating an out-of-date system would be of limited value at best and dangerous at worst.

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[5] It is possible that some US-made receiver/decoders may require that geographic data be programmed using a format corresponding to US Federal Information Processing Standard (FIPS) codes, rather than Canadian SGC codes. If this is the case, each SGC code will need to be manually mapped to a suitable dummy FIPS code, with care being taken to ensure that a code corresponding to a nearby US area is not employed.

Since receiver/decoder set-ups will be complex, it is unlikely that many licensees of OTA transmitters will have the in-house expertise to do this within the time-frame currently being contemplated by the CRTC. For most, this will be a function that will need to be carried out by external consultants and installers, of which there is a limited supply in Canada.

My conclusion: Implementation of alerting based on geo-coding that goes beyond simple identification of the central local market should be phased in over time, starting with the major markets and moving later to medium and smaller markets.

6. Jurisdictional issues

Related to the geographic coding issues is the matter of the jurisdiction of governments and agencies responsible for issuing emergency alerts. If SGC codes corresponding to an entire broadcast service area are programmed into a NAADS receiver/decoder, this device will respond to qualifying alerts issued by any agency or government that has emergency management responsibilities within each SGC code that is programmed. Unless the province or territory has a single central clearance and issuance point for all alerts, as is the case in Alberta, it is virtually certain that duplicate (and even contradictory) messages will be issued from time to time by the different emergency measures officials or jurisdictions that are dealing with a single event. So far, the SOREM group has yet to announce a solution that will prevent multiple messaging for single events in jurisdictions where no central message coordination exists.

But even in Alberta, where message issuance is centralized, there can be problems in border areas contiguous with BC, Saskatchewan or NWT. Alberta Emergency Alert (AEA) does not currently feed its own alerts to the NAADS, so messages it originates are available only to in-province broadcasters that subscribe to the AEA system and also use the alerting receiver/decoders that the agency supplies at public expense. Will this mean that Alberta stations which also serve parts of an adjacent jurisdiction will need to acquire duplicate receiver/decoders, so that they can respond to alerts issued by the AEA and by any neighbouring authority employing the NAADS?

There is no evidence that the many jurisdictional protocols and other arrangements that will be required to prevent the broadcasting of multiple alerts for the same event will be implemented all across Canada by the end of this year. Therefore, if the mandatory broadcast carriage scheme envisaged by the CRTC goes ahead according to this schedule, there are bound to be many occasions when over-alerting and possibly conflicting messaging will occur.

My conclusion: Unless and until jurisdictional protocols that prevent messaging conflicts and over-alerting are negotiated among neighbouring governments, broadcasters serving border areas should only be required to carry messages originating from a single authority. Generally this should be the administration having jurisdiction over the primary service area of the undertaking; however, broadcasters should be free to enter into other voluntary arrangements with neighbouring jurisdictions where this is appropriate.

7. The BDU problem

As currently worded, the proposed CRTC regulations require OTA broadcasters and BDUs to act independently of each other with respect to the carriage of qualifying alerts. That is, both the broadcasters and the BDUs that carry their signals must take action to insert alerts when they are issued. The regulations make no provision for BDUs to refrain from transmitting messages that must be carried in any event by the OTA stations they distribute.

The implementation of alerting by BDUs through directed channel change technology (DCT) is not likely to be problematic. Under this scheme, the BDU digital set-top box automatically switches viewers located in affected areas to a special channel devoted to emergency alerts. The versions being distributed by the OTA stations that are carried by the BDU will thereby be blocked.

However, where a BDU chooses to visually display alerts using crawling text (or pop-ups) over regular programming, it is quite likely that non-time-coincident displays of the same message will occur because it is highly unlikely that both LMDs involved will commence the messages at exactly the same moment. This duplicate message crawl scenario will detract from the main purpose of TV alerts, which is to provide a single, clear, concise set of information and instructions for the public. Overlaid non-synchronous exposure of alerts on subscribers' receiving equipment will produce only confusion and annoyance among viewers.

My conclusion: <u>These problems could be avoided by obliging BDUs to either employ the DCT methodology for alerts or else suppress their own crawling alerts when it is known that the originating TV station is compelled by regulation to carry the same alert in any event.</u>

It should also be noted that the Commission's proposed regulations for BDUs require the insertion of alerts on "<u>all programming services</u> that the licensee is distributing to subscribers" (emphasis added). This appears to oblige BDUs to replace the programming on all radio broadcasting channels, carried as part of their audio services, whenever a qualifying alert is issued. Doing this would create the same "out-of-sync" problems mentioned previously for TV.

My conclusion: <u>If it was not the Commission's intent to include BDU audio services, then this issue should be clarified in any revised regulations.</u>

8. The need for regionally-based central management and message vetting

If implemented as drafted, the emergency alerting regulations currently proposed by the CRTC will almost certainly result in a high level of dissatisfaction among governments, emergency managers, broadcasters and especially the general public. This is because the national NAADS-fed distribution system that the CRTC is attempting to foster through these proposed regulations will not function properly unless and until all jurisdictions adopt their own centralized alerting message management model, similar to that already in place in Alberta.

In provinces and territories where a host of individual emergency managers, municipal politicians and police officers are authorized to issue alerts that are distributed widely to the public, there needs to be a central vetting process to minimize mistakes and abuse. The value and effectiveness of such a system has been amply demonstrated in Alberta; however, even there it took several years of sometimes bitter experience to come up with a system that works properly.

When all alerting messages originated by on-scene officials are routed through a regional operations centre before being sent to the NAADS, a number of crucial measures can be ensured, such as:

- the originator's authority to issue alerts can be quickly verified;
- verification of the event's "broadcast immediately" status can be made;
- uniform province-wide message security arrangements can be enforced, rather than depending upon each LMD to select and maintain its own system;
- adherence to the Common Look and Feel guidelines for both text and audio messages can be verified;

- audio versions of text-only messages originated by local officials and federal agencies can be created centrally, ensuring that broadcasters will be supplied with the audio files having the required level of quality;
- when TTS audio is employed, the sound quality and accuracy of pronunciation can be made uniform throughout each jurisdiction;
- message versions in non-official languages can be produced and issued, where necessary;
- centralized operations can better liaise with other jurisdictions to avoid the issuance of conflicting or duplicate messages to broadcasters located in border areas.

With respect to centralized audio message generation, it is important to realize that the vast majority of all alerting messages originate from Environment Canada; however, virtually all the alerting messages they send to the NAADS are text-only[6]. Regional alerting centres would be able to ensure that audio that meets the CLF guidelines is made available to all broadcasters, as in Alberta.

Several provincial government intervenors have suggested to the CRTC that the problem of absent audio could be resolved by requiring the NAADS to generate TTS audio before distributing any "broadcast immediately" alerts that arrive in text-only format. While this would help ensure uniformity of audio, it would not address the other critically important functions that centralized regional operations could manage. Moreover, it would put Pelmorex in the position of having to guarantee that the audio it creates for the NAADS is in fact a true and accurate representation of each and every text message.

Unfortunately, some jurisdictions have yet to recognize the dangers inherent in allowing a large list of authorized message originators to have unfettered access to the broadcasting system. By the end of this year, not all jurisdictions are likely to have set up central management and message issuance systems similar to the one established in Alberta.

My conclusion: Centralized provincial/territorial management of emergency alerts within each jurisdiction is absolutely crucial if we are to achieve both adequate security and effective operation of a broadcast-based alerting system. Enforcing mandatory broadcast distribution of emergency alerts in any provincial or territorial jurisdiction that has not implemented such a vetting system is unwise and dangerous, in view of the high potential for serious abuse and mistakes.

9. Concluding remarks

In broadcasting, vague and imprecise regulations are usually worse than no regulation at all. Regulations stifle the creativity required to achieve complex goals because the regulated become worried that not following the rules to the letter will attract sanctions. Therefore, industries tend to do exactly what regulations demand – no more, no less. Consequently, the main result of poorly-thought-out regulations is a false sense of security for those who pressed to have them adopted in the first place - in this case, the FPT governments, the CRTC and the public they represent.

The BNC 2014-85 submissions filed by broadcasters, BDUs, emergency measures authorities and others demonstrate clearly that the implementation of the broadcasting portion of the NPAS will be complex and time-consuming. The FPT governments may believe that strict CRTC regulation will guarantee achievement of a large portion of their overall objectives with respect to public warnings. Some may be especially pleased that the passing of regulations will mean that they have been successful in off-loading a huge part of the costs of the

[6] This notwithstanding the fact that EC issues audio alerts for all urgent events, via their own VHF Weather Radio broadcasting system.

National Public Alerting System (N PAS) onto others (i.e. BDU subscribers who pay for the NAADS and the broadcasters who pay all the other delivery costs). However, the practical realities discussed previously will likely produce a situation of widespread industry non-compliance that will prove problematic for the CRTC and will not get the FPT governments much closer to achieving their overall goal.

There are myriad practical realities that need to be addressed properly and fully before mandatory regulatory measures are brought into play in Canada with respect to broadcast alerts. Issuing rules prematurely, simply to meet a political imperative, is almost certainly going to result in an ineffective, costly and potentially useless national warning system, such as was the case with the original US Emergency Alerting System (EAS).

What Canada needs for its NPAS is a system that is so simple and straightforward that it can truly be described as *"…a master plan designed by geniuses for execution by idiots"*.[7] We are far from that goal at the present time and the CRTC regulations currently under discussion will simply delay the attainment of this objective if they are enacted prematurely. Their implementation needs to be postponed until, at the very least, the practical issues raised by intervenors in the present CRTC process are resolved to the satisfaction of all the key players.

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[7] Herman Wouk, *The Caine Mutiny*