Submission to the Queensland Floods Commission of Inquiry.

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RE: Emergency Warnings & Emergency Communications during Devastating Natural Events.

Recent events indicate that Australia is suffering from an increase in natural disasters that cause significant property damage and serious risk to life. These include the recent Queensland floods, devastating bush fires, tropical cyclones, potential tsunamis, earthquakes and even extended droughts.

During these various natural and almost always unexpected events, emergency communications and public warnings are critical – especially when the disasters have the potential to quickly devastate all terrestrial communication services, by destroying critical communications infrastructure – either directly or by taking out critical power supplies or communications links.

The Federal Government has been working on a range of emergency broadcast SMS messaging services, to use as warnings of impending disaster, to people in certain geographic areas. The problem is that as soon as the terrestrial networks are destroyed, such emergency broadcast systems – based upon existing telecommunications infrastructure – is useless.

It has also been demonstrated that in many cases, the emergency occurs so quickly, that broadcast warnings are clearly an inefficient way to communicate and by the time emergency services have coordinated a broadcast SMS emergency warning, the event has overtaken the networks and the communications infrastructure is already failing.

In the recent Queensland floods, terrestrial communications networks were very quickly inundated and ceased to function. This seriously limited both the ability of emergency services to provide any telecommunications warnings to folks in certain areas and also rendered completely ineffective, the use of mobile telephones for summoning help when needed or coordinating rescues.

The general public are becoming increasingly and entirely dependent upon mobile telephone services and these are often the first communications services to be debilitated during such an emergency.

As a background - There is actually no such thing as a “mobile network”. Networks do not move – even mobile networks. Mobile telephone networks are a series of inter-connected terrestrial

transmission stations exclusively supporting mobile device users – with both voice and data communications. They are simply fixed terrestrial Radio Access Points for mobile devices.

Once these terrestrial networks are damaged by whatever catastrophe strikes an area, emergency warning systems and ongoing communications are quickly cut – placing lives and property at serious risk. The destruction of communications systems also seriously restricts the capabilities of emergency services to properly prioritise their rescue efforts.

A better system of emergency communications needs to be deployed.

Nemesys Projects have been working on developing an airborne Mobile Telephony Base Transmission System – providing emergency communications capabilities for mobile telephones at times that terrestrial communications networks are degraded or not functioning.

To understand the functions of the system, one has to understand the dynamics of a mobile telephone device. If a mobile phone is “out of range” of its home network (as obviously would happen in the situation where the terrestrial network was destroyed) it will automatically attempt to “roam” onto any available network. It will find available networks and seek to automatically connect. Whether that device is successful or not in connecting depends entirely upon the network the device is attempting to connect with, and whether the network will “accept” the roaming device.

Basically the design of the Emergency Airborne Communications Service (EACS) consists of the use of standard mobile network Base Transmission Station equipment with dedicated software, mounted on an aerial platform – either a UAV (Unmanned Aerial Vehicle – remotely piloted) or a dedicated helicopter.

The software and system “creates” a unique emergency network – accepting ALL roaming connections from ANY standard mobile telephone device within range. A suitable aerial unit has a potential line-of-sight range of some 30 kilometres – providing a potential communications radius – per EACS - of around 60 kilometres.

The software identifies the mobile device and is then capable of transmitting emergency messaging – via unique or broadcast SMS or MMS messaging - and/or is capable of providing emergency voice communications with the possessor of the device. Calls can be relayed to emergency services – via satellite or other ground station - and to whatever assistance mechanism is in place to manage the particular emergency.

The EACS can be used to relay messages to and from emergency affected areas and can be used to coordinate rescues and advise of impending changes to the emergency situation to folks within the transmission areas.

By mounting the EACS to a large UAV, extended “time over a target area” can be programmed and the aerial unit can loiter over an area or it can be programmed to roam across country – seeking additional connections and broadcasting emergency warnings or accepting requests for rescue.

To date Nemesys Projects have been unable to obtain any Government or private sector funding in order to further develop this proven communications concept or to build and have the system ready to deploy in emergency situations. It is extremely frustrating to see lives so regularly lost when the technology and resources are readily available to be able to provide significantly improved emergency communications that would coordinate and support rescue efforts.

A very useful finding of this Commission would be to recommend to Government to explore, research and commission the use of advanced aerial emergency telecommunications techniques to supplement terrestrial network failures during emergencies.