

NBN Rollout Issues

Overview of Operations

The Water Corporation maintains a Wide Areas Network that connects to approximately 132 terrestrially connected and 23 Next G connected office and operations sites. The greater numbers of sites are the Operations Information and Control (OIC) data sites, of which there are approximately 1,200 PSTN connected sites and approximately 450 Next G connected sites.

Operations Information and Control (OIC) data sites potentially encompass all the asset classes operated by Water Corporation, including:

- **Water**
 - Sources
 - Storage
 - Treatment
 - Chemical Dosing
 - Pumping
 - Metering
 - Valve
- **Wastewater**
 - Pumping
 - Storage
 - Metering
 - Valve
 - Treatment
 - Discharge

Each of these water asset classes, and others, may have vastly different civil and mechanical engineering requirements. However, from an OIC perspective, they may be viewed as a set of data points with two dimensions. The two dimensions of concern to infrastructure and communications design are the absolute size of the data set (number of points) and the time sensitivity of the most time sensitive point in the set (often referred to as criticality). A site is considered critical if it meets one or more of the following criteria:

- It is the first point of disinfection for water.
- It is a wastewater pumping station which is in a location that is sensitive due to environmental or social considerations.

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Current Status

During the planning and the rollout of the NBN, which commenced in Western Australia in 2011, the Water Corporation identified that a number of the Corporate and Supervisory Control and Data Acquisition (SCADA) assets would be affected. Existing systems that were based upon copper (PSTN, Frame, ISDN, etc.) technology would need to be migrated to NBN, or completely exited for an NBN (IP) compatible solution.

The most prolific SCADA asset that is affected by the NBN rollout is the Ademco Dialler and Receiver System. This provides alarm communication between remote infrastructure and the State Wide Operations Centre. A rotary dialling system is used at the John Tonkin Water Centre to receive the Ademco alarm calls allowing a single number to be used on all units. The Corporation is in the process of replacing approximately 800 dialler-based sites, over a period of approximately five years.

The NBN is also being provisioned for green-field sites, particularly in new land developments. The Corporation is currently utilising NextG in these areas (where available), as NBN is not provisionable to our non-addressable sites.

The Water Corporation is currently receiving exemptions from disconnection for PSTN sites that have been notified for disconnection within the 18 month window as mandated by NBN.

Specific Issues

Industrialised NTD

The NTD that is currently provided by NBN for installation inside buildings does not comply with requirements for operation in an outdoor field cabinet. The device provided is large, has a narrow operating temperature range, and is not robust enough for use in an industrial environment.

A hardened device is required that is suitable for use in the context of the operation of critical infrastructure. Many cabinets in rural areas will have internal temperatures ranging from below 0 °C to +70°C.

A SCADA system relying on a non-industrialised NTD for these sites may be significantly less reliable, as the failure rate of the NTD would increase significantly outside of its approved operating temperature range. The Corporation would then be unable to remotely operate the site, or receive any alarms generated by the site during downtime. Depending on the nature of the failure, this could result in significant environmental, supply safety/health, reputational or financial impact.

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Exemption Validity Period

Although the Corporation has been receiving exemption from disconnection for a number of OIC data sites, there has been no confirmation of the duration of the exemption, nor the period that will be provided to migrate these sites once the exemption has expired.

This represents a significant operational risk at these locations. Should suitable notice not be provided for expiration of the exemption, the Water Corporation may not have sufficient time to migrate these sites to an alternate communications medium, if one is available in the area.

As the Corporation plans its capital program many years in advance the need to migrate a large number of OIC data sites to an IP solution at one time would place significant stress on the capital program, which may result in the requirement for the delay of other significant or business critical projects to free up capital for this implementation. This would also be compounded by limitations on the number of sites that can be migrated in a year due to requirements for back-end commissioning, integration, and testing.

Greenfields Sites

New developments areas are being provisioned with NBN services, but due to the lack of process available for new non-addressable sites, there is no way to provision a service to the required operational locations. This problem is being exasperated by the unavailability of Next G at a number of these developments, which forces the Corporation to use alternative communication mediums, such as Terrestrial Satellite.

Sites in remote areas, or where the process control at the site has been determined to be critical to the operation of water or wastewater schemes, are specified under our engineering standards to have redundant communications. This requirement is especially essential in cyclone prone areas where primary communications may fail or sites may be physically inaccessible for lengthy periods. The lack of redundant services may prevent the remote control or the receiving of alarms from the site. Where a failure has occurred, this could result in significant environmental, supply safety/health, reputational or financial impact.

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Rotary Dialling Groups

The Ademco receiver system employed by the Corporation utilises a Rotary Dialling Group. The receiver has 8 physical PSTN connections that are linked to a Rotary Group with one phone number. When the Leederville area is declared NBN ready, the Rotary Group will be retired by Telstra.

Removal of the rotary group would result in the following:

- Diallers across the state would have to be physically, manually reprogrammed with the numbers for the receivers as configured.
- Each receiver would be allocated its own number. If a receiver were busy for an extended period of time, alarms from other diallers configured to call that receiver may not be acknowledged.

The operating efficiency and capability of the Ademco Receiver system will be significantly diminished if the Corporation is forced to use the above configuration.

Provision of Service for Non-Addressable Sites

The NBN service is currently only available for Addressable Sites – sites that are a habitable building. Many Corporation OIC data sites consist of an outdoor field cabinet, which does not meet the definition of an Addressable site. NBN will not provision a service for a non-addressable site.

If exemptions for these sites are rescinded, the Corporation will be without terrestrial services for these sites. The lack of redundant services may prevent the remote control or the receiving of alarms from the site. Where a failure has occurred, this could result in significant environmental, supply safety/health, reputational or financial impact.