

12 December 2014

Ms Christine McDonald
Committee Secretary
Standing Committee on Environment and Communications
Legislation Committee
Parliament House, Canberra ACT 2600

Dear Ms McDonald,

Post-Implementation Review – Melton Deployment Trial

Thank you for your letter of 4 December 2014 and the Committee's request that the Melton review document be provided as soon as possible.

Firstly, we apologise if there has been any confusion on the availability of the document. I note per your letter, as NBN Co had previously given an undertaking to do so, NBN Co offered to table the document at the Senate Estimates Hearing of 20 November as referenced in Hansard at page 47.

On the evening no Committee member or Committee support staff sought to retain a copy of the document. I further note that we had the same document to hand and directly referenced it at the Senate Select Committee meeting of 2 December where again it was not requested.

I now attach the document referred to in my evidence. You will note on Slide 6 that there are several redactions in the table relating to *Average Per Premises Costs*. These have been made to avoid the release of sensitive information that could do harm to the company in its commercial negotiations.

Should you have any further queries please do not hesitate to contact Ian McAuley

Yours sincerely,

Greg Adcock

Chief Operating Officer

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3MLT-10 Deployment Trial Post Implementation Results and Recommendations (NBN Co Internal)

NBN Co Construction Services Group
October 2014

This document sets out NBN Co's proposals in respect of certain aspects of the National Broadband Network. The contents of this document represent NBN Co's current position on the subject matter of this document. The contents of this document should not be relied upon by our stakeholders (or any other persons) as representing NBN Co's final position on the subject matter of this document, except where stated otherwise. NBN Co's position on the subject matter of this document may also be impacted by legislative and regulatory developments in respect of the National Broadband Network. All prices shown in this document are exclusive of GST.

3MLT-10 Deployment Trial Background

The Melton 10 (3MLT-10) Deployment Trial was initiated by NBN Co to create an internal baseline/benchmark for programme, productivity and cost performance utilising:

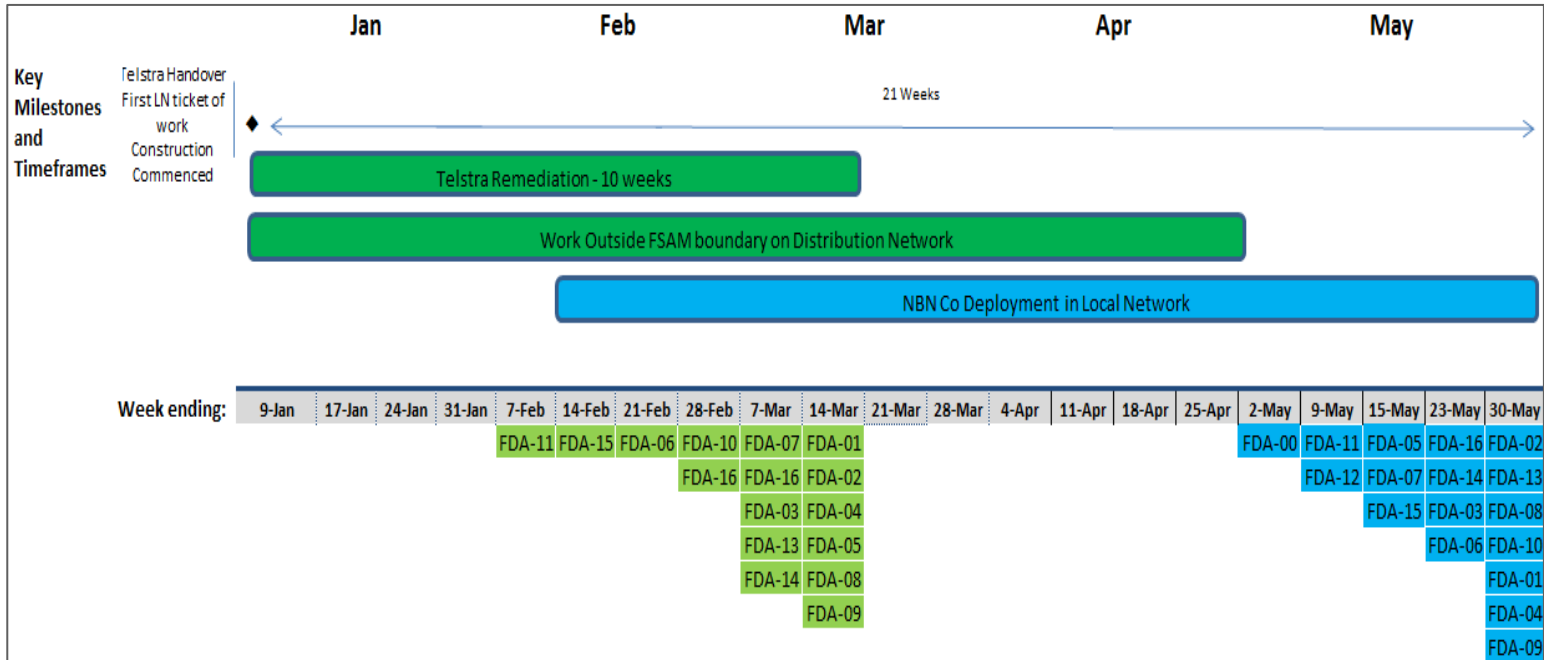
1. The Render deployment management system
2. Innovative specified equipment
3. Intelligent Optical Loss Measurement (iOLM)
4. Tier 3 contracting model
5. Build Drop installation during LN/DN build

Telstra remediation works commenced in January 2014. NBN Co engaged a panel of 3 contractors directly to carry out the works with a uniform Schedule of rates. Specified equipment was free issued by NBN Co to the Contractors.

3MLT-10 is a large rural Victorian residential FSAM with 2492 GNAFs. It has a mixture of old and new infrastructure, required significantly less new build, a low number of MDU sites, hence also classified as high growth area. There are also a relatively large number of 1 to 5 acre lots and standard residential blocks within the FSAM.

The 3MLT-10 deployment was the first FSAM to utilise a Telstra FIR / NBN Co design.

3MLT-10 Build Timeline (LN/DN)



- Build Drops:**
- Civil work commenced outside FSAM boundary on 9th Jan
 - Work commenced inside the FSAM boundary on 9th Feb after first FDA handover from Telstra.
 - Build Drops commenced in Melton on 11th Mar

3MLT-10 Scorecard for Comparison

Deployment data for all FSAMs 'Ready for Service' or 'Build Commenced' in the comparable FSAMs has been used as the basis for comparison. This results in a group of 4 FSAMs for comparison.

The scorecard below was prepared and agreed by all of the NBN Co Stakeholders prior to commencement of the trial, and was to be the basis for comparison at the end of the trial period.

Subject	Metric	Method of Measurement
HSE	Audit Completion Rate	% of audits and inspections achieved
	Asset Strike Rate	Average strikes per 10km of duct
	Cost of Asset Strikes	Asset strikes per FSAM * \$10k/Strike
Cost	Per Premise Cost @ SC1	Average Per Premise Costs
	Average cost per drop	Average Per Premise Costs
	Per Premise Cost @ SC2	Average Per Premise Costs
Build	Build Duration to SC1 (RFS)	Business days post Telstra Handover
	Build Duration to SC2	Business days post Telstra Handover
Quality	Submit to Met FDA PC	Average calendar day duration
	Qty Major defects	Average quantity per FSAM
	Qty M1 defects	Average quantity per FSAM
Stakeholder Management	Customer Complaints	% of complaints per premises passed

* Whilst asset strike rate & cost was included, data on this was not captured for the comparable FSAMs (done by region and by DP, not by FSAM)

Comparable FSAMs to Melton10

A comparable FSAM to 3MLT10 would be a Vic rural FSAM with a low number of MDU sites, similar GNAF count and requiring a lower than average amount of new build.

FSAM	Melton - 10	Bacchus Marsh - 02	Ballarat - 04	Karingal - 04
GNAF	2492	1987	2143	2755
New Build	5.3	10.3	13.2	5.9
MDUs	51	127	69	54
Region	Vic	Vic	Vic	Vic

3MLT-10 Scorecard at Completion

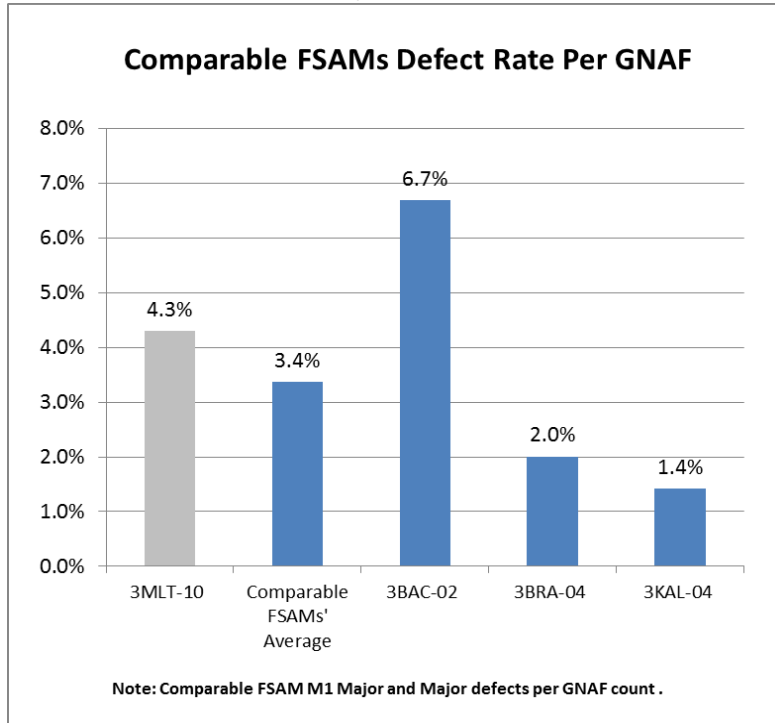
This 3MLT-10 Deployment Trial scorecard is included below.

Subject1	Metric	Method of Measurement	Comparable FSAMs	3MLT-10
HSE	Audit Completion Rate	% of audits and inspections achieved	Variable	100%
	Asset Strike Rate	Average number of asset strikes	No Data	0
	Cost of Asset Strikes	Average strike per FSAM	No Data	\$0
Cost*	Per Premise Cost @ SC1 (GNAF Passed)	Average Per Premises Costs	██████████	██████████
	Average cost per drop	Average Per Premises Costs	No data	██████████
	Per Premise Cost @ SC2	Average Per Premises Costs	No Data	██████████
Build	Build duration @ SC1	Business days post Telstra Handover	248 Days	115 Days
	Build duration @ SC2	Business days post Telstra Handover	No Data	122 Days
Quality	Submit to PC FDA met	Average calendar day duration	No Data	51 Days
	Qty Major & M1defects	Average quantity per FSAM	72	107
Stakeholder Management	Customer Complaints	% of complaints received per premises passed	1.12%	0.20%

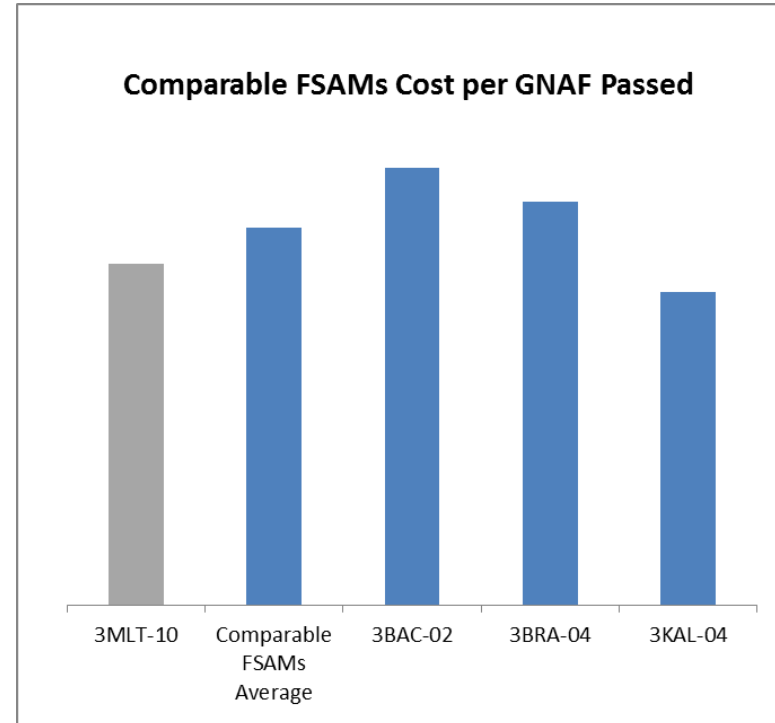
Note: Cost data for Melton 10 excludes Render costs (approx. \$330,000), Site office set up costs (approx. \$20,000) as well as staff wages for resources assigned to project (4-6 additional resources).

3MLT-10 performance Vs Comparable FSAMs

Quality of build



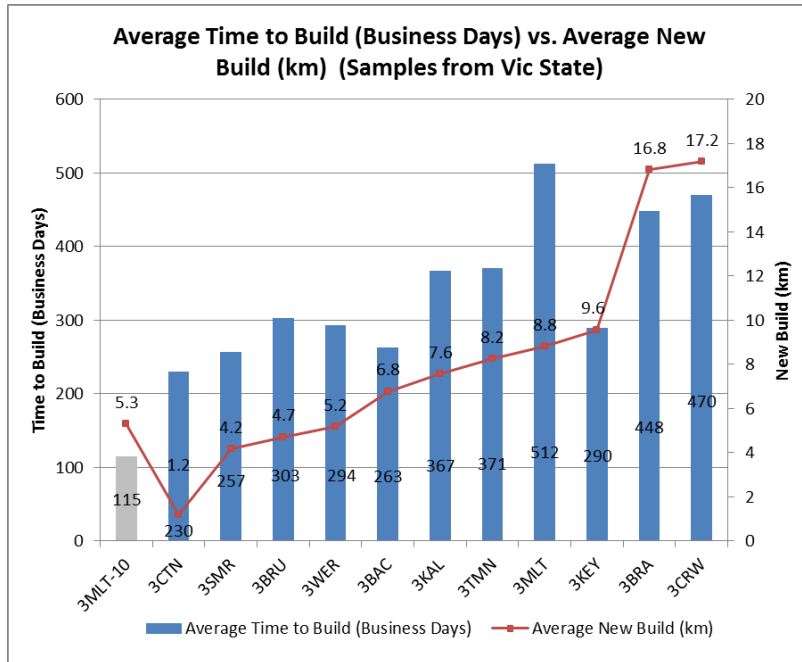
Cost to Build



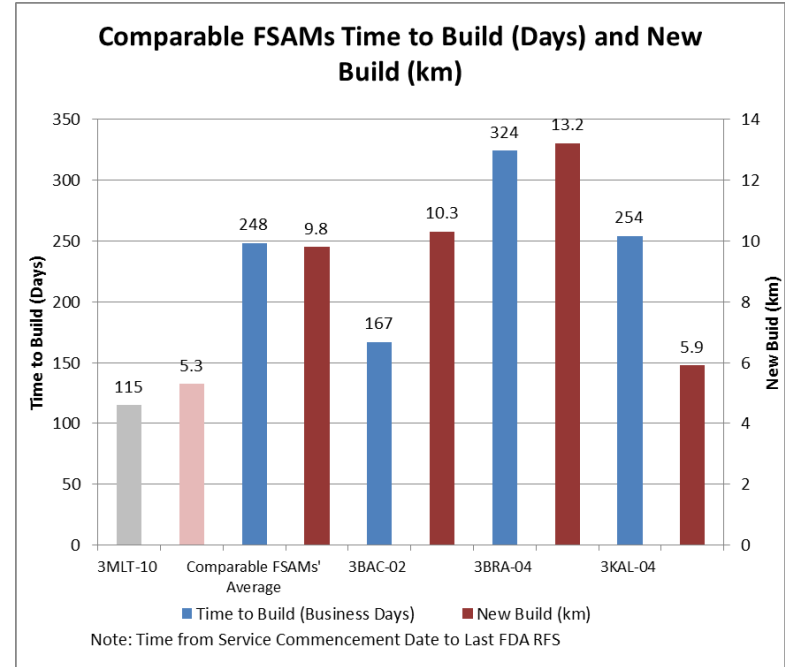
- 3MLT-10 defect rate per GNAF is higher than comparable FSAMs.
- 3MLT-10 cost per GNAF passed is lower than comparable FSAMs in Vic region.

3MLT-10 Performance Vs Comparable FSAMs for Build time

Build Time vs New build



Time to Build Vs New Build

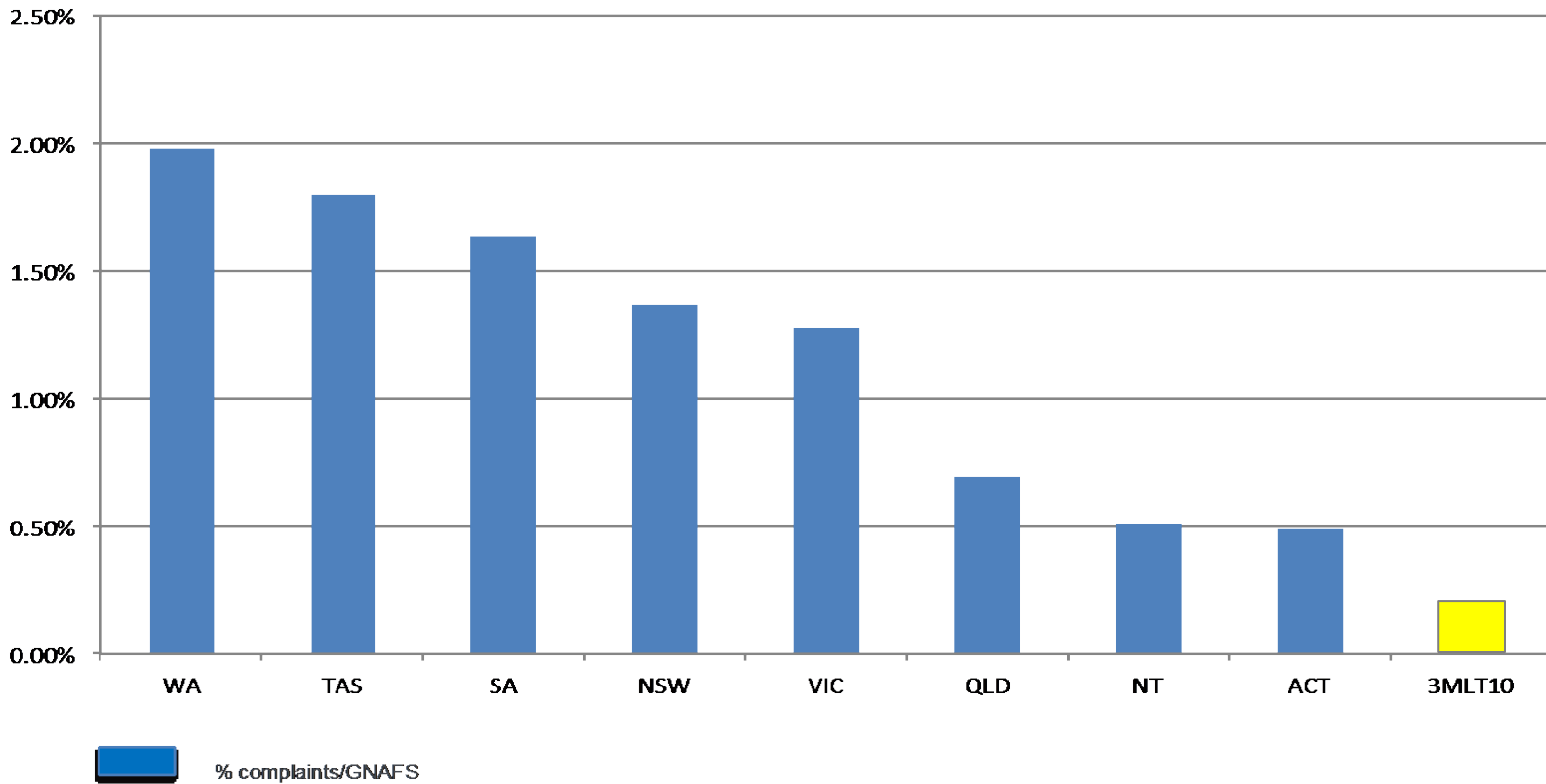


- The above graphs indicate the time to build is directly proportional to amount of New Build required, higher the amount of new build is, longer it takes to build an FSAM.

3MLT-10 Customer Complaints Results

Despite carrying out Build Drops in parallel with the LN/DN deployment, the 3MLT-10 team received a very low level of complaints from the Public. A site office was established with 2 full time resources to help maintain a healthy relationship with local residents.

Jan 14 – May 14 average complaints per premises passed



Render Deployment Design Capability VS Outcomes Achieved

Design Capability	Outcome Achieved
Automatically create the work scope, BoQ directly from the DDD	<ul style="list-style-type: none"> Achieved
Allocate work to Contractors using Ticket of Work system.	<ul style="list-style-type: none"> Partially Achieved Work allocated using Excel Spreadsheets No ToW integration
Automatically create the work schedule based on resources.	<ul style="list-style-type: none"> Partially achieved With subsequent improvements to the system towards the end of project.
Automatically release 4 days worth of work to crews each day (top up) to ensure continuity & visibility of work.	<ul style="list-style-type: none"> Partially Achieved Work released using Excel Spreadsheets.
Only release tasks when all preceding tasks had been completed.	<ul style="list-style-type: none"> Achieved
Status of completed work updated daily based on tasks completed daily, optimally reschedule the remaining work at task level.	<ul style="list-style-type: none"> Status of completed tasks was managed manually Optimal rescheduling was achieved with system subsequent improvements
Automated Variation & As-built management	<ul style="list-style-type: none"> Not Achieved All variations and As-built data was captured manually
Build the network as it was designed, eliminating “air gaps”.	<ul style="list-style-type: none"> Partially Achieved High number of design variations and defect rate was encountered.

Results of Innovative Specified Equipment used in 3MLT-10 trialled as CTO Directive



SMALL DIAMETER CABLE

Overall indications are that SDC is lighter and flexible making it faster to deploy

- Lighter and more flexible making the cable easier to handle and transport
- Easy to coil (smaller layout area required) for cable directional changes during haul, greater utilisation of Telstra infrastructure
- Less physical strain on crew, HSE benefit + reduction in crew number required for hauling



SMALL FOOTPRINT MULTIPOINT

Significantly increased installation efficiency – 5 mins install vs. 15 minute install for traditional multipoint

- No requirement to mount the multipoint
- Can be used in smaller pits, reducing the need for Telstra pit remediation which significantly reduces HSE risk associated with Asbestos Containing Material (ACM)

3MLT-10 Innovative Build Methods and Work Practices Trialled

Intelligent Optical Loss Measurement (IOLM) Testing:

- Take accurate measurements without the need to set any parameters (i.e. correct wavelength, pulse widths, test time etc).
- Analyse results to NBN Co standards, automatically providing consistency across all skill levels.
- Assess complex faults allowing immediate rectification reducing rework and improving productivity.
- Up to a 54% reduction in time & cost over traditional OTDR testing methodology.

100% Asset Locating:

- Non destructive potholing/Hydro Vacuum was performed to protect ground assets.

HSE initiatives:

- Safety barricading in lieu of bunting
- Waste water harvesting and re-use
- Distribution pipe straightener removed memory of the 100mm pipes minimising HS&E incidents
- Safety in design and pro active hazard identification and mitigation

3MLT-10 Project Governance Initiatives Trialled

Program Scheduling:

- With Contractors, schedule and issue the work, crew by crew with a 4 day look ahead, and then update progress into Render System using excel spreadsheets.
- Provided accurate forecasts to all Stakeholders

Construction issues Management:

- Managed all construction issues at the task/resource/GNAF level

Project Governance Meetings (twice a week)

- Provided a forum to jointly address schedule, resourcing and construction issues

Focus on Culture and Work Environment:

- Established site office and warehouse and ran daily site (toolbox) meetings

Results of 3MLT-10 Build Drop Installation during LN/DN Build

Build drop installation was carried out concurrently with the LN/DN deployment. The following were the key lessons learned from the trial:

1. Mobilising once to carry out build drops as well as LN/DN was well received by the Public as it minimised disruptions in the area.
2. The commercial engagement model needs to take into consideration the broad range of different circumstances regarding drop construction.
3. Rates for drops were not considered attractive by Contractors and two contractors walked away from the work. Contractors who carried out LN/DN at the same time as Build Drop works were able to manage this better, in effect “subsidising” the drop work with the LN/DN at times.
4. Scoping/proving of drops is recommended as a schedule of rate item.
5. Build drop installation concurrent with LN/DN eliminates the occurrence of “air gaps”.
6. HSE needs to be maintained with the drop crews as diligently as it is with the LN/DN crews.
7. 3MLT-10 was only tested till the multiport, a 14% failure rate has been identified for drops. It’s recommended to test network until PCD (Premises connection device) to capture any failed drops before bringing FSAM into service.

3MLT-10 Deployment Trial Results/Recommendations

Based on the results and experience gathered during the Melton 10 Deployment Trial:

1. The Render deployment management methodology and system

- The Render deployment management system did not deliver to its original design, there is still significant amount of work required on the functionality of the system.

2. Innovative specified equipment

- The benefits of Small Footprint Multiports (SFMs) were further validated through the Melton10 trial since the first use in December 2013 in NSW. SFMs were trialed in Melton10 as a CTO directive to validate results from initial trials. SFMs have since been adopted as BAU practice - 85 new FSAMs have been designed using the SFMs, 2 Bulk IFDVs were issued for a total of 92 FSAMs under construction. This resulted in 1,081 pits no longer requiring remediation with 1,182 SFMs being installed instead of normal Multiports
- Small diameter cables add significant benefits to NBN Co deployment and are now adopted as BAU practice. Since January 2014, 64 FSAMs have been designed using the SDCs.

3. Innovative build methods and work practices

- Broad adoption of Intelligent Optical Line Measurement (iOLM) testing system and procedures as the evolving Industry Standard,
 - Implement the Phase 2 & 3 iOLM initiatives as per CTO recommendations – Automation of integration to NBN Co Workbooks
- Broad adoption of the tools to support the design walkout & constructability reviews (ideally) prior to completion of design or prior to the commencement of construction to reduce In-field design variations.

3MLT-10 Deployment Trial Results/Recommendations Cont.

- 4. Project governance initiatives add sub-task level visibility to Delivery Partners but may not be directly beneficial to NBN Co:**
 - Project governance meetings, work allocation, program scheduling, construction issue management on sub-task level visibility to delivery partner.
 - Setting up site office and full time resources are not scalable to NBN Co deployment.
 - Contractors lost productivity by attending daily tool box meetings.
 - This information will support DPs in better program management.
- 5. Build Drops installation during LN/DN build is recommended with testing:**
 - Broad adoption of build drop installation in parallel with LN/DN works and testing the network to SC2 to avoid network shortfalls and improve customer experience.
- 6. 100% Asset Locating is not a scalable solution for NBN Co deployment:**
 - Non destructive potholing/Hydro Vacuum was done at the cost of \$262K to NBNCo for locating and protecting every asset in the ground.
- 7. Design walkout/Constructability Review is Recommended :**
 - Joint NBN Co/Contractor constructability walkout prior to completion of the design would have eliminated many of the 262 design variations encountered.
- 8. HSE initiatives should be shared as best practice with DPs**

What's Changed from the Preliminary PIR Document

Slide	Preliminary PIR Document August 2014	Slide	Peer Reviewed PIR Document October
2	Trial background and 3MLT10 FSAM geographic definition	2	Trial background updated to include the IOLM testing and updated 3Melton10 FSAM geographic definition.
5	3MLT10 build time line	3	3MLT10 build timeline updated to show work commencing outside FSAM boundary on 9 Jan
3	3MLT10 Scorecard compared with Ballarat FSA and Victorian region averages.	4	3Melton10 Scorecard compared with 4 comparable FSAMs from Vic region.
		5	Slide added on comparable FSAMs to 3Melton10 based on GNAF count, amount of New Build and number of MDU sites in a Vic rural area.
9	3MLT10 build scorecard compared to Ballarat FSA and Vic Region averages	6	3MLT10 build scorecard comparison to comparable FSAMs. Updated per premise cost @ SC1 & SC2 from Oracle, updated build duration based on timeline from slide 3 and updated number of defects from DMS (Defect Management System)
4	3MLT10 Cost and build profile compared to Ballarat FSA	7	3MLT10 cost and build quality compared to selected comparable FSAMs from slide 5
6	3MLT10 build timeline compared to Ballarat FSA and Vic Region FSAMs	8	3MLT10 build timeline and amount of new build compared to selected comparable FSAMs from slide 5
8	3MLT10 customer complaints result	9	3MLT10 customer complaints result
10,11	Render Deployment Management results.	10	Render Deployment system requirements compared to outcomes achieved from the trial.
12	3MLT10 Innovative Specified equipment results	11	Results of Innovative Specified equipment trialed in 3MLT10 as CTO directive

What's Changed from the Preliminary PIR Document Cont.

Slide	Preliminary PIR Document August 2014	Slide	Peer Reviewed PIR Document October
13	3MLT10 Innovative build methods and Work Practices results	12	3MLT10 Innovative build methods and Work Practices results * Removed In Line jointing, Ground penetrating radar and All material locator, unable to find benefits and evidence of trial in 3Melton10. * Removed Design Walkout/Constructability review as it has been a BAU practice.
14	3MLT10 project governance initiatives results.	13	3MLT10 project governance initiatives trialed (minor updates)
15	3MLT10 Build Drops installation during LNDN build results	14	3MLT10 Build Drops installation during LNDN build results (no change)
16, 17	3MLT10 trial recommendations	15,16	3MLT10 trial recommendations updated based on peer review. * Updated Render System Recommendations * Added additional details for Innovative Specified Equipment in NBN Co deployment. * Added additional details on Innovative build methods and work practices: IOLM testing, HSE Initiatives and tools to support design walkouts * Added facts around 100% asset locating, Design walkouts.
7	3MLT10 Productivity results compared to Vic Average		Slide removed as we were unable to find the data source and validate data.