

Subject:	Update Overhead Design Standards to AS7000	Control Ref No:	StdsA347
		Date Issued:	18/12/2015
		Supersedes:	
For Policy/Procedure/Manual:	Manual 302 – Overhead Design Manual Mains Des (Limit State) Application Worksplans Application	Expiry Date:	31/12/2016
Originating Dept:	Engineering Standards and Grid Modernisation		

1. Purpose

This Standards Alert is to advise Planners, Designers and Field crews that for distribution overhead designs, Energex has now adopted the limit state design methodology as specified in AS/NZS7000 – Overhead Line Design. In adopting this standard, revised versions of the Overhead Design Manual (RED 302), “Worksplans” design application and the “Mains Des (Limit State)” application have been released.

All designers should commence using the new versions of these manuals and applications.

2. Background

Energex previously used a Working Stress Design methodology to determine Maximum Working loads based on specified safety factors. The new Limit State Design methodology uses Ultimate Loads to determine Limit State strengths based on component strength factors.

The Limit State design methodology was defined for OH line design in the early 2000s in the ENA C(b)1 Guideline document, at which time it was adopted by the transmission network designers. In November 2010, the ENA guideline was superseded by the Australian Standard AS/NZS7000 Overhead Line Design – Detailed Procedures which follows the internationally accepted limit state design principles.

Energex has now updated their systems and documentation to utilise the limit state calculation methodology and the transition to Limit State has been completed. All designs will now be issued in the new format showing both Working Stress and Limit State design values.

Working Stress values will no longer be used for pole/stay selection. Energex intend to show both Working Stress and Limit State strength values on designs for a period of time to allow staff and contractors time to adjust to the changes. Once the new Limit State methodology is sufficiently embedded and accepted, the requirement for Working Stress values will be removed from designs.

The Energex design applications - Mains Design (MainsDes) and Worksplans - have been upgraded so that AS/NZS7000 can be implemented.

3. Changes

Distribution overhead lines will now be designed in accordance with Limit State (LST) design methodology as described in AS/NZS 7000. Working Stress (MWT) design values will also be shown for a period of time, but will be called SST to align with the new terminology (refer below). Hence ratings and loadings of components will be calculated using both SST and LST values. This change will mainly affect distribution network designers, though others will notice a change in terminology and schedules.

Abbreviations:

MWT	Maximum Working Tension*	SST	Serviceability State Tension
EDT	Every Day Tension	LST	Limit State Tension

*It is important to note that under the new terminology, MWT is now called SST.

3.1. Overhead Schedule Changes

Schedules created in the Workplans design package have been changed to rename MWT to SST and include LST values. Example of old and new schedules are shown below.

Also note that the old schedules showed the “MWT Angle”, whereas the new schedule now shows the “EDT Angle”. This modification has been made due to a change in the way wind loads are required to be calculated in the new standard. This change can result in the maximum load being applied at more than one angle under different wind conditions. Therefore the EDT angle is now shown to prevent confusion and show the direction of the long term sustained load on the pole.

Example of existing schedules:

OVERHEAD WORK SCHEDULE													
LOCATION	STN No.	SITE I.D. (POLE No.)	POLES										
			MWT ANG	EDT kN	MWT kN	EXISTING	RECOVER	ERECT	SINK	FOOT	COMP ID	ALIGN	LCC

Example of new schedules:

OVERHEAD WORK SCHEDULE														
LOCATION	STN No.	SITE I.D. (POLE No.)	POLES											
			EDT ANG	EDT kN	SST kN	LST kN	EXISTING	RECOVER	ERECT	SINK	FOOT	COMP ID	ALIGN	LCC

Pole Codes & Stay Wire Capacities will be changed as shown below.

OLD Pole Code	Length (m)/MWT (kN)	Example: 14/12
NEW Pole Code	Length (m)/SST (kN)-LST (kN)	Example: 14/12-22

Stay Wire	OLD (MWT) Capacity	NEW (LST) Capacity
7/2.75 GZ	25 kN	39 kN
19/2.00 GZ	37 kN	55 kN
19/2.75 GZ	56 kN	108 kN

3.2. Pole Strength Calculator

The pole strength calculator has been updated & is now incorporated in the MainsDes application. Note that only the “EDT” and “LST” values are to be used to determine the design strength of poles. The “MWT” values are shown for historical purposes only.

4. Manual Updates

The following manuals have been updated:

- Manual 302 - Overhead Design Manual
- Manual 367 - Resource Estimation Guide

Updated copies of these manuals are available via the Engineering Standards & Grid Modernisation intranet site or via the RED document system for internal staff.

The up-dated manuals are available to external service providers via the internet. These Manuals are uncontrolled documents when printed.

5. External Designs in Progress

All designs submitted to Energex shall be compliant with limit state methodologies as of 01 February 2016. Any designs submitted after this date shall be in the new format with both Working Stress and Limit State Design values.

Any designs submitted prior to this date will be accepted in either the new format, or the previous Working Stress only methodology.

In addition to the above, for contestable design works (e.g. designs produced externally for developer design and construct projects), a design using only Working Stress methodology remains acceptable only if the “Subdivision Supply Agreement”, or “Works Project with Construction Agreement” (as applicable), is accepted prior to the agreement expiry date and construction is completed according to the agreement conditions. As of 01 February 2016 all designs submitted, including for re-issue of agreements that have expired, or for agreements where construction conditions have not been met, will be required to be submitted in the new format with both Working Stress and Limit State Design values.

6. Further Information

For further information contact:

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