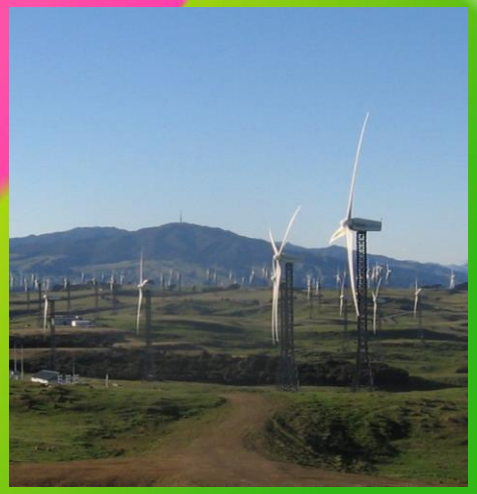
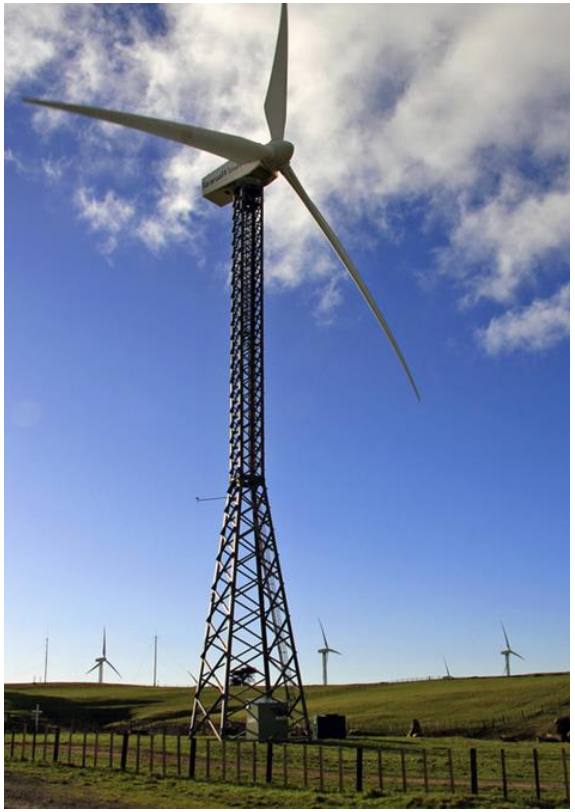
12/05/2014

Broken at the age of 15?

NZWEA Conference April 2014



Tararua Wind Farm



- 48 Turbines commissioned 1999 (Stage 1)
- 55 Turbines commissioned 2004 (Stage 2)
- Tararua Ranges near Palmerston North
- Blade Length 23.5 metres
- Hub height 40 metres
- WT Elevation at tower base – 370 to 500mASL
- Wind direction predominantly NW
- Annual Energy – 250GWh (Stage 1+2)
- Average wind speeds 9.5m/s
- 660Kw / 690V
- Galvanised , bolted lattice towers
- Transformer in kiosk at base of turbine
- Feeds into PowerCo 33kV network

The V47 is a proven robust turbine with simple configuration and lends itself to refurbishment and retrofits

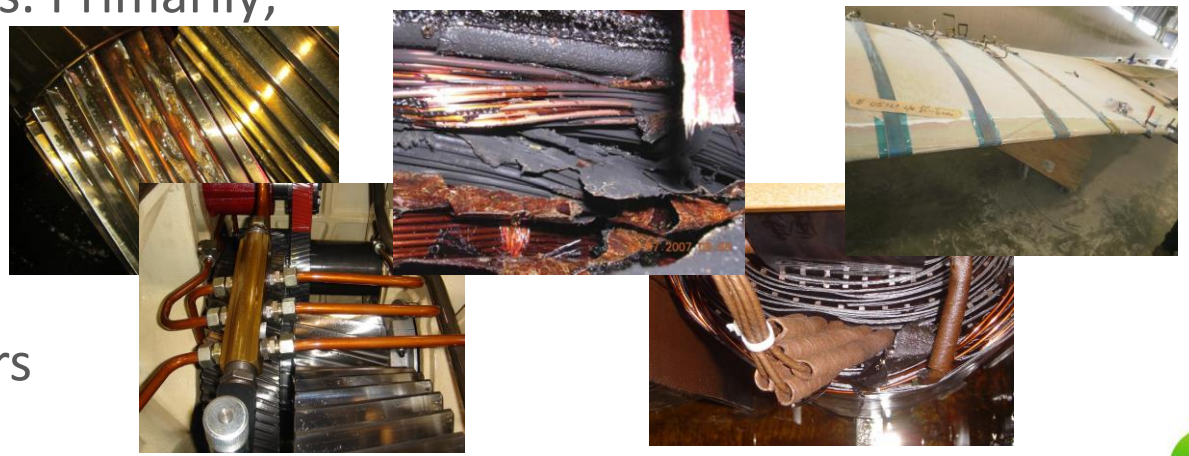
The issues for age 15 and beyond

- Tararua Stage 1 is now 15 years old with a design life of 20 years
- Mature Wind Farms tend to see increasing O&M costs
- Industry is generally nervous about increasingly mature wind farms or wind farms approaching the end of design life term.
- Perception of greater risk to major components – blades!
- Potential for O&M Contract renewals to be over conservative
- Little or no R&D associated with older turbines
- Few options for optimising site with existing turbines
- Flat development window for foreseeable future

- Asset Managers must now focus on life extension and develop and implement ideas to maintain value to the business

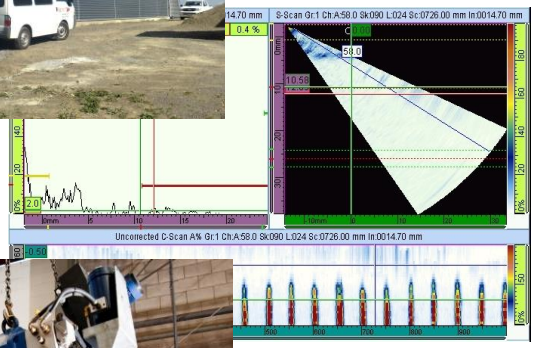
Beyond age 15 - Our Challenges & Drivers

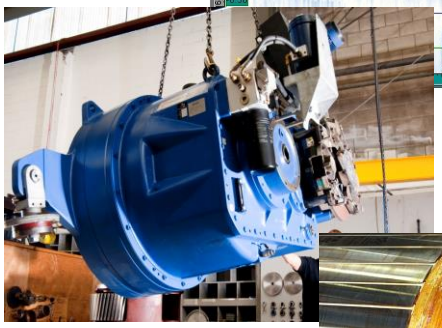
- Maintain farm economically and safely until re-development of the site can occur
- Increasing age and declining availability over whole farm
- Current Development and re-development environment is flat hence more efficient turbine retrofits not yet an option
- Optimising where practicable and maintaining economic availability utilising the existing equipment
- OEM spares support
- Major component failure leading to poor reliability, availability and economics. Primarily;
  - Blades
  - Gearboxes
  - Generators
  - Yaw Plates
  - Transformers

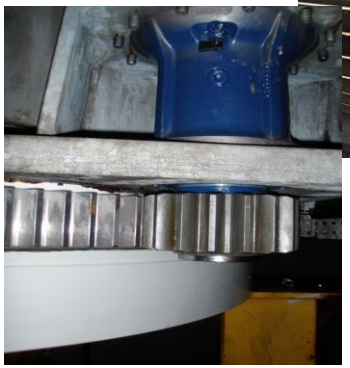


Beyond age 15 – Our Solutions

- Maintain sound working relationships with OEM and after market suppliers – align objectives within O&M contracts
- Develop cost effective repair and retrofit solutions in conjunction with OEM and local maintenance service providers
- Tower integrity is high
- Continue to balance costs of new vs refurbished major components and development of supply chain with latest retrofits (GB)
- Develop local understanding and expertise in repairs of blades. Investment in blade repair facility
- Improve blade condition monitoring processes utilising latest technologies ground or drone + improved Thermographic
- Optimise Ultrasonic NDT processes and blade condition categories – Phased Array programme
- Commission comprehensive independent Performance Assessment of Wind Farm stages – understand the issue and make changes to recover any lost economic availability.







A little worse for wear but definitely not broken; and with plenty of life in the old gear yet!

Thank you