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APEX 2025 Presentation

Engineering Tomorrow's Energy Future

(Lessons from a Graduate Engineer)

How collaboration makes us stronger

Helen He - ElectroNet

Why I am here

- For graduate Engineers
- Share real experiences
- Student→ Engineer
- Teamwork & Collaboration

Kaiwera Downs Wind Farm Stage 2 (KD2)

155MW → 36 Turbines

Enough power for 93,000 homes

Stakeholders:

- Mercury
- Transpower
- Vestas
- Higgins
- ElectroNet

My role:

- Secondary design + SCADA integration

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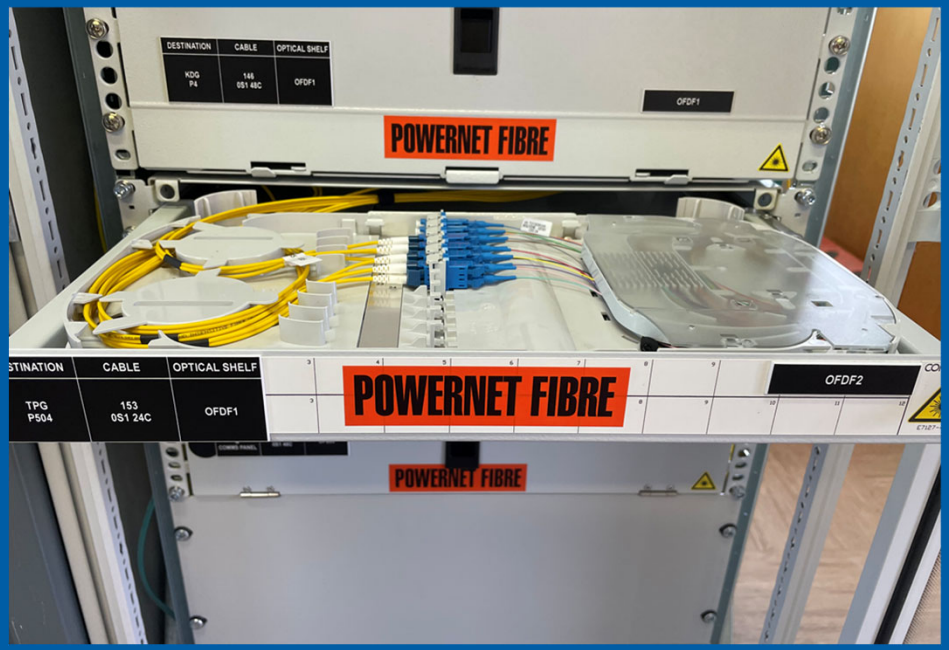
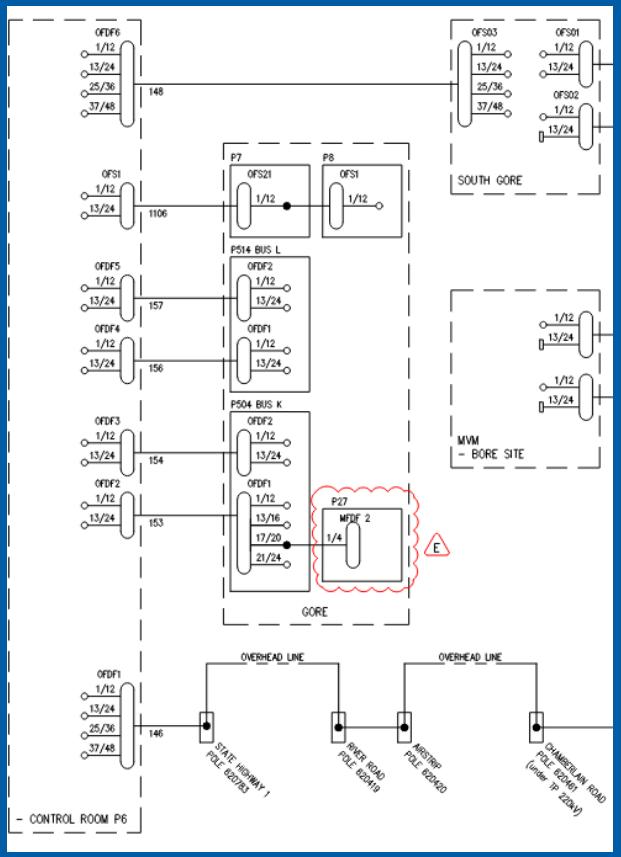
Example 1 - Fibre Connections

Interface between Transpower, Mercury, PowerNet

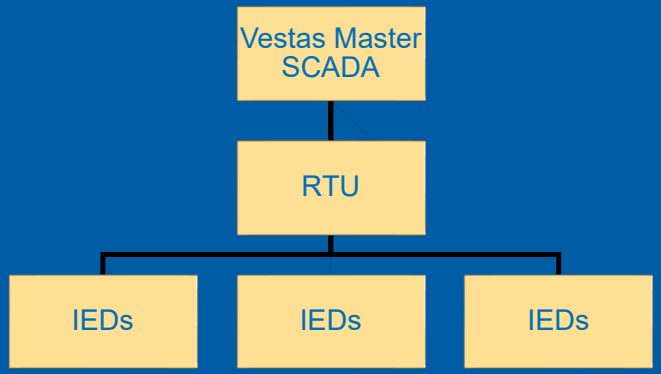


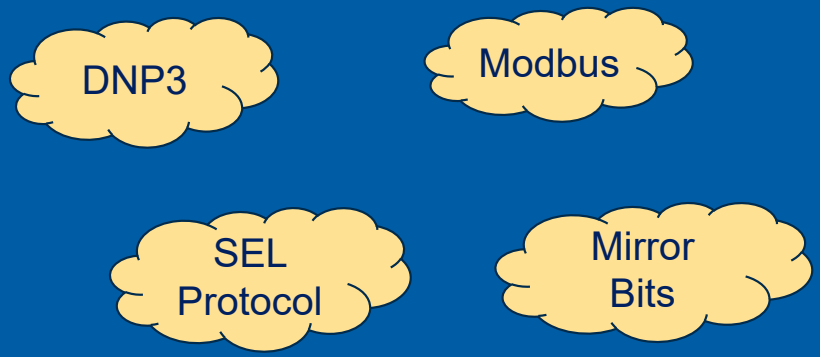
Lessons from Fibre Work

- Communication > Assumptions
- Right time and right way
- A clear drawing = good communication
- Collaboration starts in design



Example 2 – SCADA Signal Mapping





0			Equipment			RTAC			
Numbe	Monitored by Mercu	Equip. ID.1	Equip. ID.2	Data Point Description	TYPE	Relay Word Bits	Source Expression	RTAC Tag
83		T1_AVR_SEL2411.	DI.	T1_AVR_SEL2411.Loss of Volts	SPS	T00_LED	T1_AVR_SEL_2411_SEL.FM_INST_T00_LED	Master_Map_DNP.BI_00083
84	Y	T1_AVR_SEL2411.	DI.	T1_AVR_SEL2411.Transformer Over Flux	SPS	T02_LED	T1_AVR_SEL_2411_SEL.FM_INST_T02_LED	Master_Map_DNP.BI_00084
85		T1_AVR_SEL2411.	DI.	T1_AVR_SEL2411.Tap Change In Progress	SPS	T03_LED	T1_AVR_SEL_2411_SEL.FM_INST_T03_LED	Master_Map_DNP.BI_00085
86		T1_AVR_SEL2411.	DI.	T1_AVR_SEL2411.Tap Changer In Local	SPS	T04_LED	T1_AVR_SEL_2411_SEL.FM_INST_T04_LED	Master_Map_DNP.BI_00086
87		T1_AVR_SEL2411.	DI.	T1_AVR_SEL2411.End of Tap Range	SPS	T05_LED	T1_AVR_SEL_2411_SEL.FM_INST_T05_LED	Master_Map_DNP.BI_00087
88	Y	T1_AVR_SEL2411.	DI.	T1_AVR_SEL2411.Tap Change Blocked	SPS	T06_LED	T1_AVR_SEL_2411_SEL.FM_INST_T06_LED	Master_Map_DNP.BI_00088
89	Y	T1_AVR_SEL2411.	DI.	T1_AVR_SEL2411.GOOSE Messaging Fail	SPS	SV12T	T1_AVR_SEL_2411_SEL.FM_INST_SV12T	Master_Map_DNP.BI_00089
90	Y	T1_AVR_SEL2411.	DI.	T1_AVR_SEL2411.Tap Change Fail	SPS	SV13T	T1_AVR_SEL_2411_SEL.FM_INST_SV13T	Master_Map_DNP.BI_00090

		Equipment			Data Point	RTAC		Modbus
Number	Monitored by Mercury	Equip. ID.1	Equip. ID.2	Description	Data Point Description	SEL / MODBUS Name	Relay Word Bit	
8			DO.					Master_Output_MODBUS.COIL_00008.operSet.ctlVal
9			DO.					Master_Output_MODBUS.COIL_00009.operSet.ctlVal
10	Y	T1_AVR_SEL_2411.	DO.	Raise Command	T1_AVR_SEL_2411.Raise Command	T1_AVR_SEL_2411_SEL.FO_RB_RB01.operPulse	RB01	Master_Output_MODBUS.COIL_00010.operSet.ctlVal
11	Y	T1_AVR_SEL_2411.	DO.	Lower Command	T1_AVR_SEL_2411.Lower Command	T1_AVR_SEL_2411_SEL.FO_RB_RB02.operPulse	RB02	Master_Output_MODBUS.COIL_00011.operSet.ctlVal
12	Y	T1_AVR_SEL_2411.	DO.	AVR in Auto Command	T1_AVR_SEL_2411.AVR in Auto Command	T1_AVR_SEL_2411_SEL.FO_RB_RB03.operPulse	RB03	Master_Output_MODBUS.COIL_00012.operSet.ctlVal
13	Y	T1_AVR_SEL_2411.	DO.	AVR in Manual Command	T1_AVR_SEL_2411.AVR in Manual Command	T1_AVR_SEL_2411_SEL.FO_RB_RB04.operPulse	RB04	Master_Output_MODBUS.COIL_00013.operSet.ctlVal
14	Y	T1_AVR_SEL_2411.	DO.	Alarm Reset	T1_AVR_SEL_2411.Alarm Reset	T1_AVR_SEL_2411_SEL.FO_RB_RB05.operPulse	RB05	Master_Output_MODBUS.COIL_00014.operSet.ctlVal

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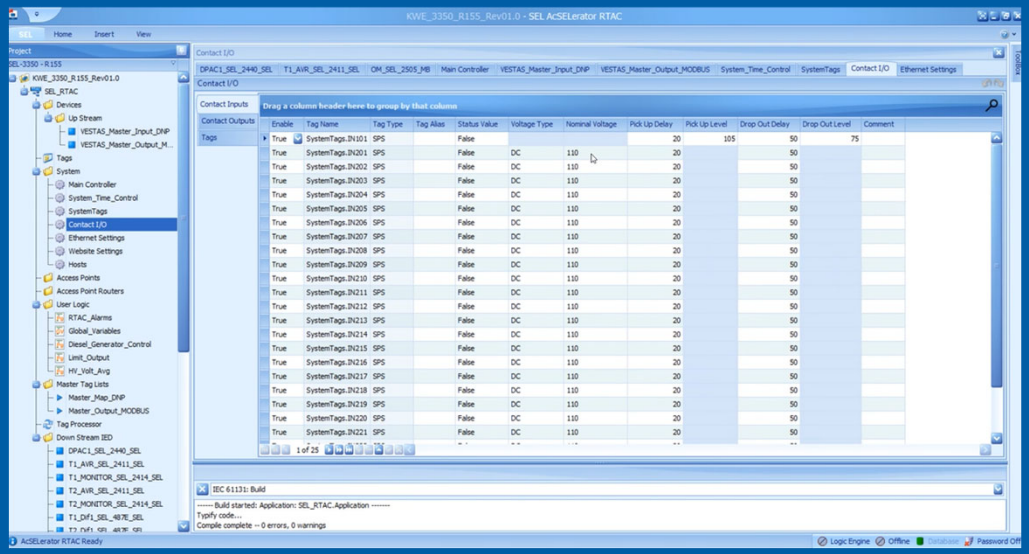
Lessons from SCADA Mapping

- Check, test, then test again
- Collaboration = many small alignments
- Clarity beats complexity
- Think “system”, not “signal”



My Collaboration Toolkit

- 🗣️ Communicate early
- 👀 See from others’ perspective
- 🧩 Understand interfaces
- 🧠 Share knowledge openly
- 💪 Trust the team

My Small Work → Big Impact

- Small details = big system reliability
- Collaboration connects every discipline
- Renewable energy projects = teamwork at scale
- “Many hands, one purpose”

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What the Chopsticks Taught Me

- One engineer = one chopstick
- Together = strength, stability, resilience
- Collaboration builds trust and learning

What I’ve Gained

- Confidence in communication
- Understanding big-picture systems
- Respect for other disciplines
- Passion

Any questions?