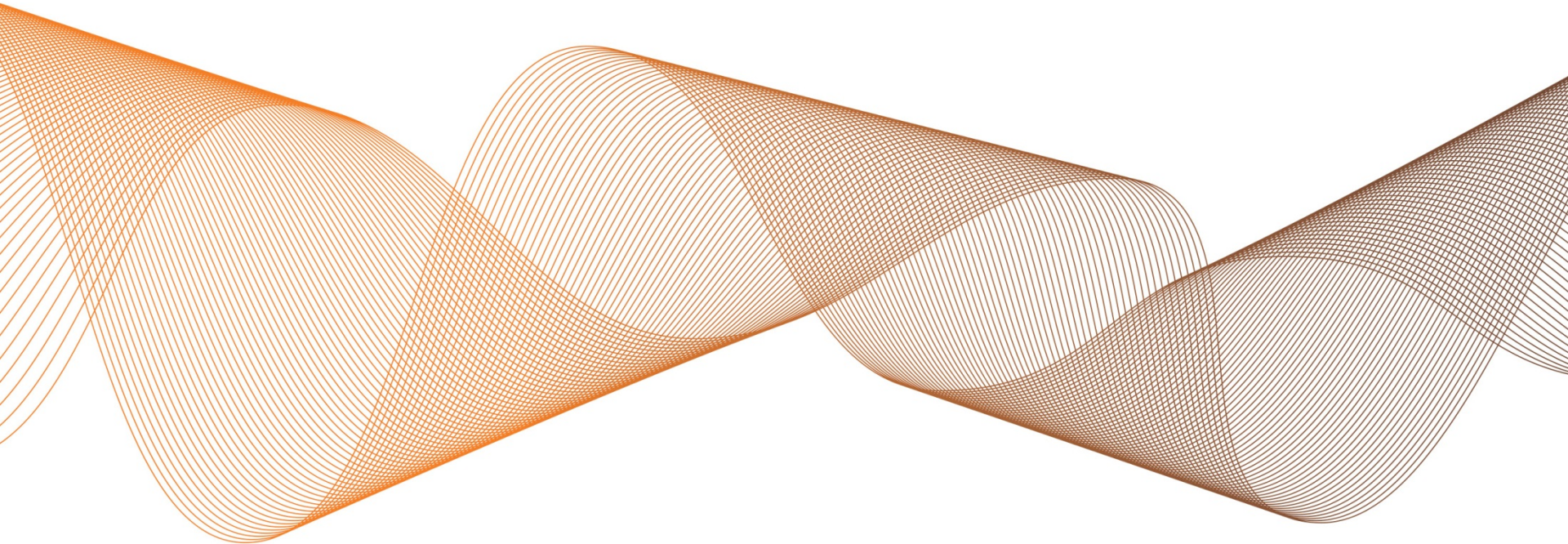


# System Management SCADA

Replacing missing or incorrect values with estimates



Connecting people with electricity



# What is SCADA?

- ***Supervisory Control And Data Acquisition***, a computer system for gathering and analysing real-time data. SCADA systems are used to monitor and control a plant or equipment in different industries.

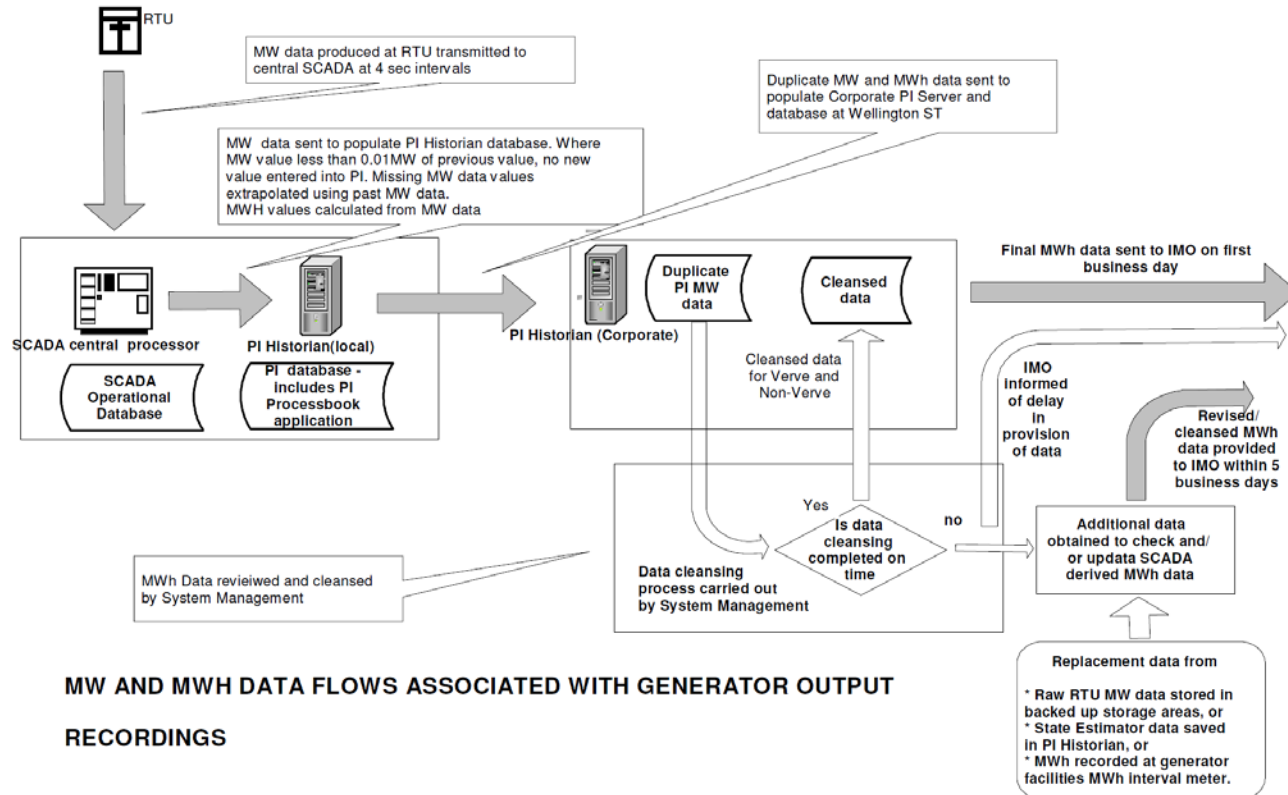
# SCADA data files sent to the IMO

- Real Time Data
- Interval Resource EOI
- Interval Relevant Dispatch Quantity
- Resource EOI \*
- Relevant Dispatch Quantity \*
- Resource SCADA
- Operational Load

\* provisional and final



# SCADA collection process



## MW AND MWH DATA FLOWS ASSOCIATED WITH GENERATOR OUTPUT RECORDINGS

# Real Time Files (No Replacement )

- Every 30 Seconds
  - Real Time Data
    - Total Generation
    - Total Load (loss factor adjusted)
    - Total Spinning Reserve
- Every 30 Minutes
  - Interval Resource EOI
    - Each Resource End of Previous Interval MW
  - Interval Relevant Dispatch Quantity
    - Total End of Previous Interval MW

# Resource EOI (Provisional)

- Daily ( 2 hours after end of trade day )
- Check 48 records for each resource
  - Missing intervals replaced
    - end of interval in PI historian if available
    - last known value within interval
    - straight line interpolation if consecutive intervals
    - Scheduled Generators < 1 MW replaced with zero
    - -ve values replaced by zero for all generators
  - If multiple resources affected file delayed

# Relevant Dispatch Quantity (Provisional)

- Daily ( 2 hours after end of trade day )
- Check 48 records
  - Total Compared with sum of EOI data
  - Data graphed to check smoothness including
    - Total of Synergy portfolio
    - Total of Non Synergy resources
  - Missing Intervals recalculated from EOI data
  - File delayed if EOI process incomplete.



# Resource SCADA

- Daily file by noon ( sent 1 day ahead )
- Check 48 records for each resource
- Process Book Graphs ( 9 – 10 am )
  - recalculated using MW
  - recalculated by straight line
  - Recalculated by profile
  - Zeroed below threshold
- Intervals of interest checked with Control Room logs (trip etc)



# Operational Load

- Daily file by 10 am ( sent 1 day ahead )
- Check 48 records
- Graph vs Resource SCADA
- Data can be recalculated from resource SCADA
- File can be delayed if alternative sources required for resource SCADA

# Resource EOI (Final)

- Daily (10 am)
- Check 48 records for each resource
  - Intervals of interest from other processes
  - Questionable intervals replaced
    - Recalculation within PI historian
    - Provisional Resource EOI methods
    - Dispatch Instruction records
    - Meter Data estimation (double)
    - Compliance (forced outage)
    - State Estimator
  - File may be delayed if waiting on other data

# Relevant Dispatch Quantity (Final)

- Daily ( 10 am)
- Check 48 records
  - Total recalculated from Resource EOI if required
  - Data graphed to check smoothness including
    - Total of Synergy portfolio
    - Total of Non Synergy resources
  - File delayed if EOI process incomplete.

# Alternative Sources of Data (1)

SHORT NAME	RESOURCE_NAME	Revenue Meter	State Estimate
ALCOA	ALCOA_WGP	Yes	Yes
ALINTA	ALINTA_PNJ_U1	Yes	Yes
ALINTA	ALINTA_PNJ_U2	Yes	Yes
ALINTA	ALINTA_WGP_GT	Yes	Yes
ALINTA	ALINTA_WGP_U2	Yes	Yes
ALINTA	ALINTA_WWF	Yes	Yes
COLLGAR	INVESTEC_COLLGAR_WF1	Yes	Yes
EDWFMAN	EDWFMAN_WF1	Yes	Yes
GLDFLDPW	PRK_AG	Yes	Yes
GRIFFIN2	BW2_BLUEWATERS_G1	Yes	Yes
GRIFFINP	BW1_BLUEWATERS_G2	Yes	Yes
GRNOUGH	GREENOUGH_RIVER_PV1	Yes	Yes
MERREDIN	NAMKKN_MERR_SG1	Yes	Yes
MUMBIDA	MWF_MUMBIDA_WF1	Yes	Yes
NEWGEN	NEWGEN_KWINANA_CCG1	Yes	Yes
NGENEERP	NEWGEN_NEERABUP_GT1	Yes	Yes
PERTHNRGY	ATLAS	Yes	Yes
STHRNCRS	STHRNCRS_EG	Yes	Yes
WENERGY	PERTHENERGY_KWINANA_GT1	Yes	Yes
WPGENER	ALBANY_WF1	Yes	Yes
WPGENER	GRASMERE_WF1	Yes	Yes
WPGENER	KEMERTON_GT11	Yes	Yes
WPGENER	KEMERTON_GT12	Yes	Yes
WPGENER	KWINANA_GT2	Yes	Yes
WPGENER	KWINANA_GT3	Yes	Yes
WPGENER	PPP_KCP_EG1	Yes	Yes
WPGENER	SWCJV_WORSLEY_COGEN_COG1	Yes	Yes



# Alternative Sources of Data (2)

SHORT NAME	RESOURCE_NAME	Revenue Meter	State Estimate
TIWEST	TIWEST_COG1	No	Yes
VINALCO	MUJA_G1	No	Yes
VINALCO	MUJA_G2	No	Yes
VINALCO	MUJA_G3	No	Yes
VINALCO	MUJA_G4	No	Yes
WPGENER	COCKBURN_CCG1	No	Yes
WPGENER	COLLIE_G1	No	Yes
WPGENER	GERALDTON_GT1	No	Yes
WPGENER	KWINANA_G6	No	Yes
WPGENER	KWINANA_GT1	No	Yes
WPGENER	MUJA_G5	No	Yes
WPGENER	MUJA_G6	No	Yes
WPGENER	MUJA_G7	No	Yes
WPGENER	MUJA_G8	No	Yes
WPGENER	MUNGARRA_GT1	No	Yes
WPGENER	MUNGARRA_GT2	No	Yes
WPGENER	MUNGARRA_GT3	No	Yes
WPGENER	PINJAR_GT1	No	Yes
WPGENER	PINJAR_GT10	No	Yes
WPGENER	PINJAR_GT11	No	Yes
WPGENER	PINJAR_GT2	No	Yes
WPGENER	PINJAR_GT3	No	Yes
WPGENER	PINJAR_GT4	No	Yes
WPGENER	PINJAR_GT5	No	Yes
WPGENER	PINJAR_GT7	No	Yes
WPGENER	PINJAR_GT9	No	Yes
WPGENER	WEST_KALGOORLIE_GT2	No	Yes
WPGENER	WEST_KALGOORLIE_GT3	No	Yes

# Alternative Sources of Data (3)

SHORT NAME	RESOURCE_NAME	Revenue Meter	State Estimate
BLAIRFOX	BLAIRFOX_KARAKIN_WF1	Yes	No
BLAIRFOX	BLAIRFOX_WESTHILLS_WF3	Yes	No
DCWL	DCWL_DENMARK_WF1	Yes	No
LNDPLLGP	CANNING_MELVILLE	Yes	No
LNDPLLGP	KALAMUNDA_SG	Yes	No
LNDPLLGP	RED_HILL	Yes	No
LNDPLLGP	TAMALA_PARK	Yes	No
MBARKER	SKYFRM_MTBARKER_WF1	Yes	No
MHPS	MHPS	Yes	No
PERTHNRGY	GOSNELLS	Yes	No
PERTHNRGY	ROCKINGHAM	Yes	No
PERTHNRGY	SOUTH_CARDUP	Yes	No
TSLA_GER	TESLA_GERALDTON_G1	Yes	No
TSLA_KEM	TESLA_KEMERTON_G1	Yes	No
TSLA_MGT	TESLA_PICTON_G1	Yes	No
TSLA_NOR	TESLA_NORTHAM_G1	Yes	No
WGRES	HENDERSON_RENEWABLE_IG1	Yes	No
WPGENER	BREMER_BAY_WF1	Yes	No
WPGENER	KALBARRI_WF1	Yes	No

# Questions ?