Marulan Project Community Liaison Group Meeting No. 3

15 March 2012

AGENDA

Time	Item No	Topic	Presenter
4:30pm	1	Welcome & Introductions	Brendan Blakely, Elton Consulting
4:35pm	2	Outstanding Actions from Previous Meeting	Brendan Blakely, Elton Consulting
4:45pm	3	Marulan Project Update	Marcello Diamante, TRUenergy
	4	Topics of Interest	
5:15pm		-Narrabri Gas Project (ESG)	Marcello Diamante, TRUenergy
5:25pm		-Emergency Response Systems	Graham Dowers, TRUenergy
5:55pm		-Project Management	TBA, Alstom
6:15pm		-Noise	Marcello Diamante, TRUenergy
6:20pm	5	Discussion about the CLG and Marulan Project	All
6:45pm	6	Other Matters	
7:00pm	7	Next Steps, Thank you and Close	Brendan Blakely, Elton Consulting

Item 1: Welcome & Introductions

Item 2: Outstanding Actions

Outstanding Actions from Previous Minutes

Action Item	Description	Status
Narrabri Gas Project	Provide presentation on TRUenergy's interest in former Eastern Star Gas	Item 4 of Today's meeting
HSWP	Update on status of Highland Source Water Pipeline Discussions	Item 3 of Today's meeting
EMS	Emergency Management Systems for the Marulan Power Station	Item 4 of Today's meeting
Noise	Information on what 35 Decibels means	Item 4 of Today's meeting

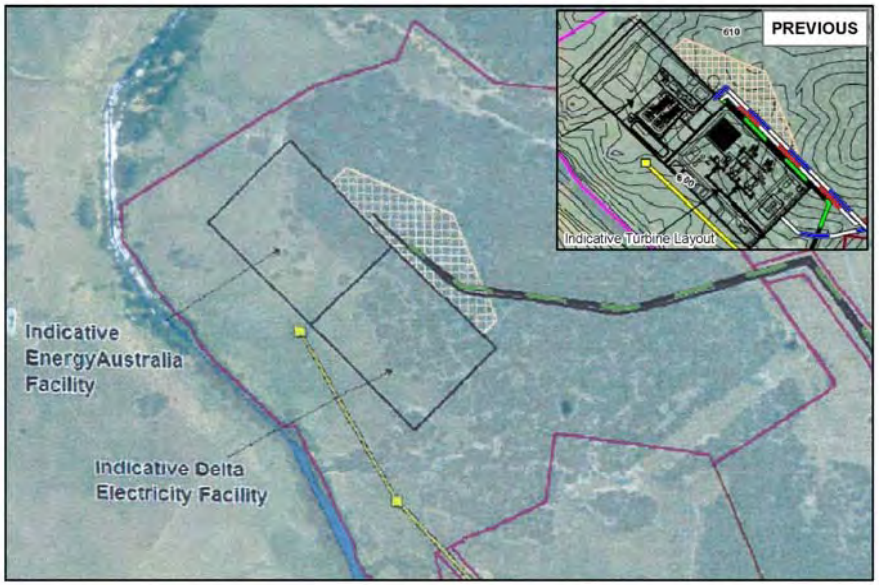
Item 3: Project Update

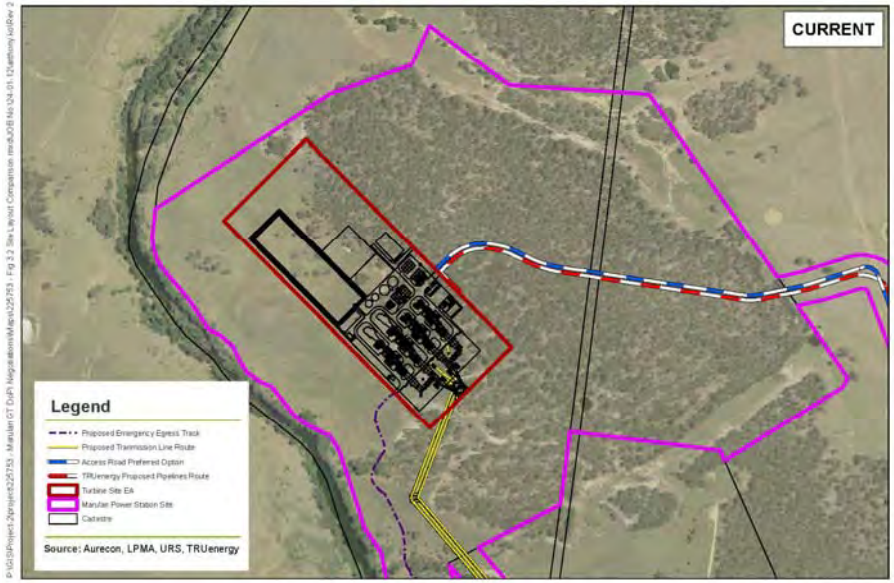
Project Background

- TRUenergy acquired the Marulan Development Site from the NSW State Government with formal transfer completed in March 2011.
- The Marulan site was proposed to be developed as 2 stand alone & separately owned Projects (by Delta Electricity (Delta) and Energy Australia (EA)) on the same land title.

  - EA: 2x OCGT → Peaking Plant only
  - Delta: 2x OCGT → CCGT Conversion

- Infrastructure common to both power stations including access road, transmission line, and gas supply pipeline were proposed to be shared.





s75W Modification

Key aspects

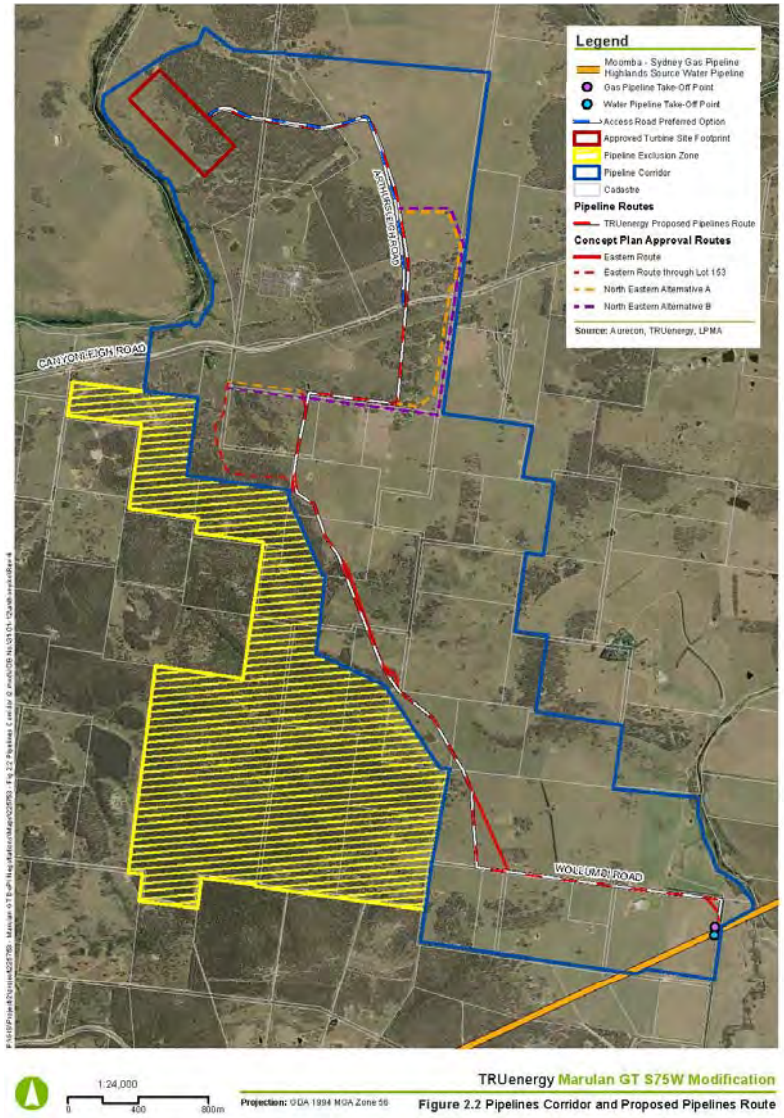
- Consolidating the Approvals for a single plant with a single owner.
  - Removal of duplicated plant
  - Integration of equipment lay down to within power station site.
  - Removal of CCGT option

- Reduction of:
  - Vegetation clearance within power station site:
    - Approved 30.5ha - Modified Project 24.4ha
  - Noise levels to receptors, ranging from 3-11 (dB)A.
  - Air emission during start-up and operation
  - Transmission line:
    - Reduced by approximately 200m
    - Relocation of transmission line tower and inclusion of works within TransGrid Marulan Substation.

- Enhanced water cycle management system:
  - Reduction of water consumption:
    - Approved 76.2ML/annum
    - Modified Project 52.5ML/annum (nominal)

- Minor realignment to the approved gas pipeline route
  - Reduced impact to farming land use
  - Reduction in the number of water crossings

- Addition of a water supply pipeline within the width of the approved gas pipeline route.
  - Reduction of operational truck movements to site



Visual Impacts

NE

Plate 1A: Visual impact assessment site 1 (R22) looking north east to the power station

Proposed view from R22 - north facing verandah

Visual Impacts

Plate 2: Visual impact assessment site 2 (R19) looking north east to the power station

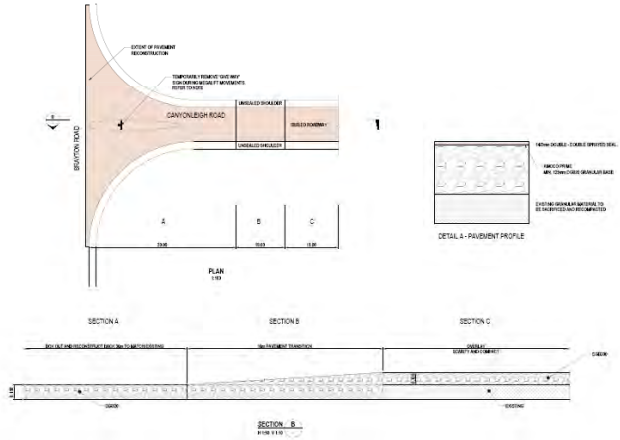
Plate 3: Visual impact assessment site 3 (R51) looking north east to the power station (not visible)

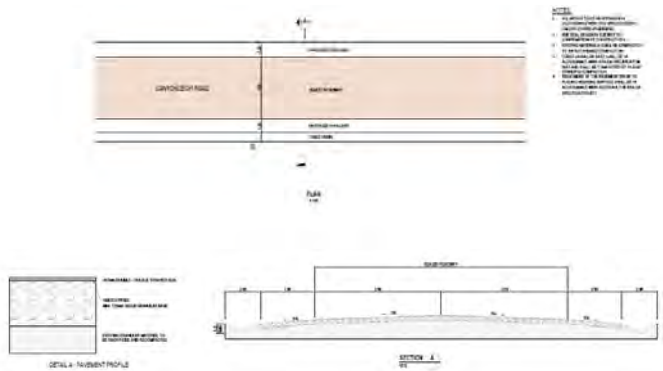
Highland Source Water Pipeline Connection

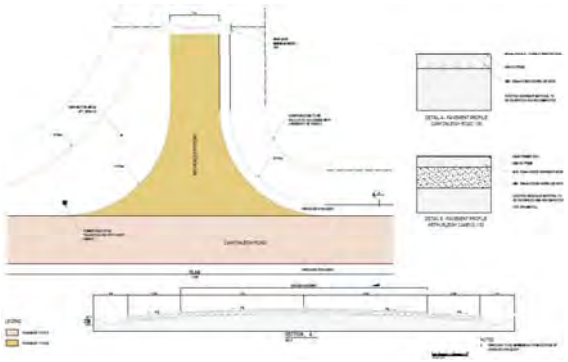
- In 2011, TRUenergy approached Goulburn Mulwaree Council (GMC) Engineering Department on technical ability to connect into Highland Source Water Pipeline (HSWP).
  - GMC were still completing the pipeline but had no objections at a technical level.
- In November 2011, TRUenergy formally approached GMC Management to request commercial access to HSWP.
  - Management were open to TRUenergy having access to water via connection to the HSWP however guidance from GMC on commercial framework required before any negotiations could commence.
- In December 2011, GMC released guiding principles for its management for commercial access to the HSWP:
  1. Water Supply for GMC is not compromised for either yield or operational purposes
  2. Access needs to deliver a tangible benefit to Council ratepayers
     - Water supply availability to residents is not compromised in any situation
     - Potential reductions in the annual $75 levy.
  3. Cost to access HSWP will include:
     - Fixed Charge for both HSWP infrastructure and proposed SCA fixed charges
     - Variable Charge covering HSWP operational costs plus profit margin and any SCA Volumetric charges
  4. The water supply for the Southern Highlands (including Wingecarribee Shire Council) is not to be compromised.
- GMC and TRUenergy are drafting up a binding term sheet confirming access to water and connection into the HSWP based on the above commercial principles.
  - Pricing to be negotiated once GMC has completed its operational plan.

Canyonleigh Road Upgrade

- TRUenergy is proposing to:
  - Re-compact and seal some 10km of Canyonleigh Road from Brayton Road intersection to the Power Station site entrance
  - Clean, reshape and deepen table drains along the sealed section of the road to improve drainage of water.
- Submitted report detailing technical specifications to GMC in March for approval
  - Feedback received from GMC to date has been positive.







Project Development

Key activities

- Awaiting approval of permit modification from DoP&I.
- Complete negotiations with Goulburn-Mulwaree Council on commercial access to Highland Source Water Pipeline
- Substantially complete connection agreement with TransGrid.
- Continuing negotiations with landowners.
- Finalise commercial and technical details with the Turbine manufacturer.
- Select contractor and complete construction of the Canyonleigh Road

- **TRUenergy targeting Final Investment Decision in Q2 2012.**

Item 4: Topics of Interest

1. **Narrabri Gas Project**
2. **Emergency Response Systems**
3. **Project Management**
4. **Noise Levels**

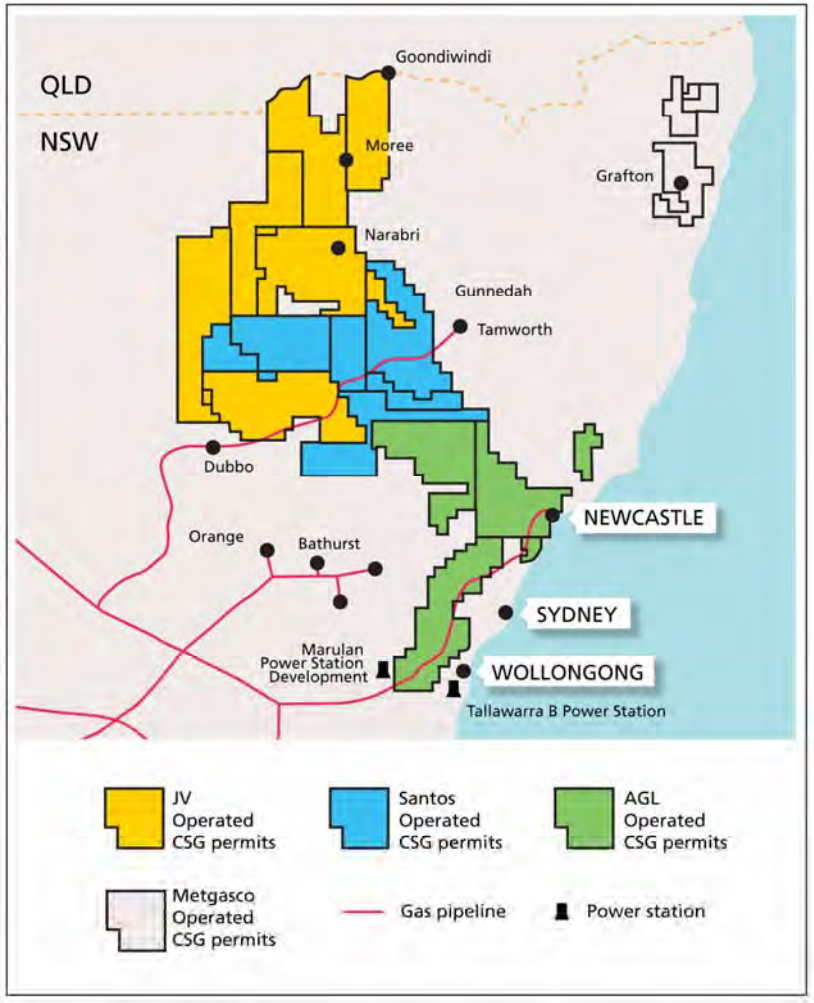
Narrabri Gas Project

Marcello Diamante, TRUenergy

Narrabri CSG Project Overview

The Narrabri project is a Joint Venture operated by Santos (80% shareholder), with TRUenergy (20% shareholder) as non operator

- Originally, TRUenergy owned a small equity stake in ESG (<5%). Non-operator role.
- Santos owned 20% equity stake in ESG and a 35% non-operator interest in the tenement.
- In November 2011, Santos completed the purchase of Eastern Star Gas (ESG) and TRUenergy joined Santos in creating a Joint Venture to manage the former ESG interests.
  - The main interest for the JV is the PEL238 exploration permit near Narrabri
  - PEL 238 contains extensive coal seam gas in a number of different coal seams
  - ESG had explored PEL 238 for nearly 10 years with 66 core holes drilled within the 8200 sq km permit
  - 7 production pilots have been installed with gas production feeding the Wilga Park Power Station near Narrabri



Immediate Focus

- Santos is the new operator.
- Santos completed independent assessment of ESG operations and provided report to NSW Govt and released publicly.
  - Findings identified process failures and impact on vegetation unacceptable to Santos
    - TRUenergy support Santos view on findings
  - Environmental impacts are limited and Santos has committed to remedies. JV has also committed to spend $20 million upgrading:
    - project sites;
    - equipment; and
    - management processes.

Main areas of TRUenergy focus

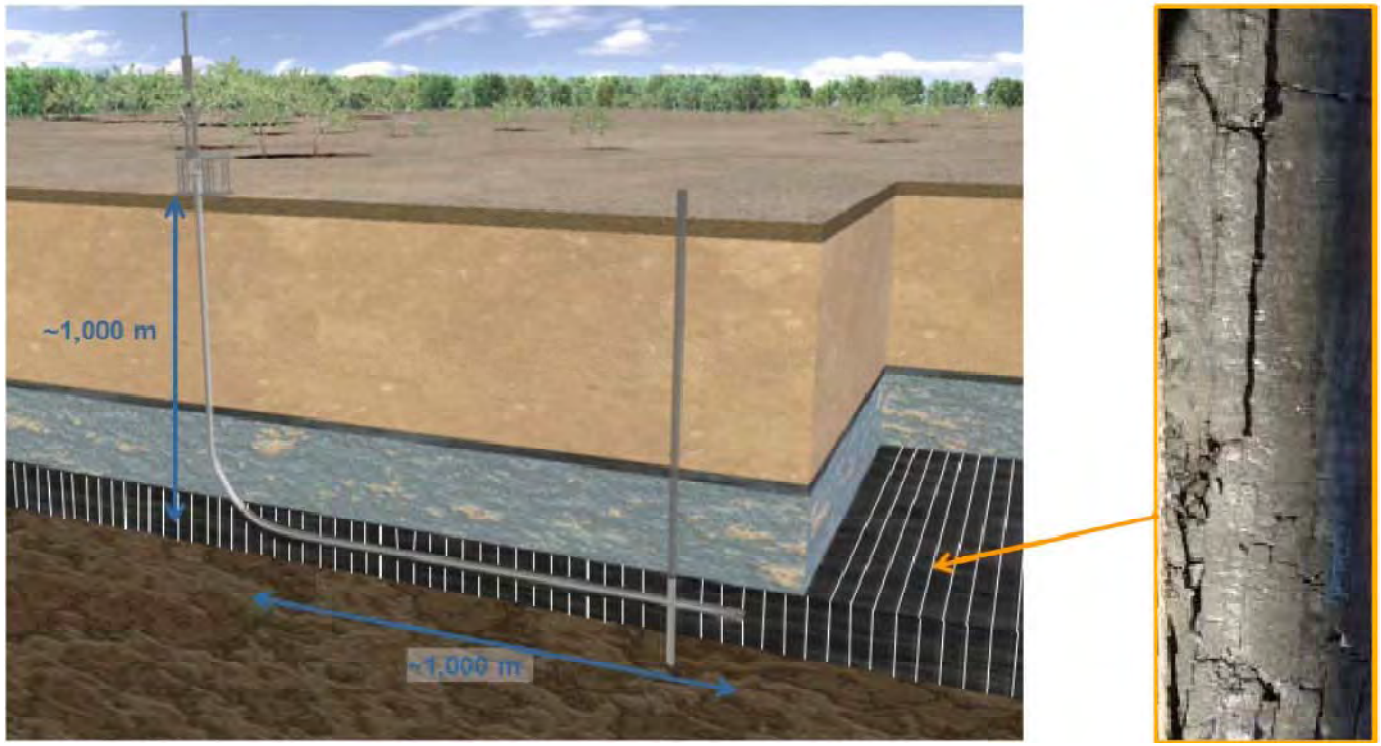
- Ensure the JV meets its community and regulatory obligations in plans for further development

2012 Plans and beyond

- Over the next 3 years the JV will be further evaluating the fields and prospects, undertaking engineering and project studies to support a development plan and planning application.
  - a JV Environmental Assessment and Development Application for CSM production will be made under Part 4 of the EP&A Act and include the required consultation and environmental studies to support the applications.

Role of Lateral Wells

- The technique of hydraulic fracturing the coal to create flow paths for the gas does not need to be used in PEL 238 even though the permit allows for this technique to be used.
  - The coal seams in this region have naturally occurring fracture cleats.
  - The drilling of lateral wells across these cleats allows the gas to be produced.



Laterals take advantage of the naturally occurring vertically fractured coal seams

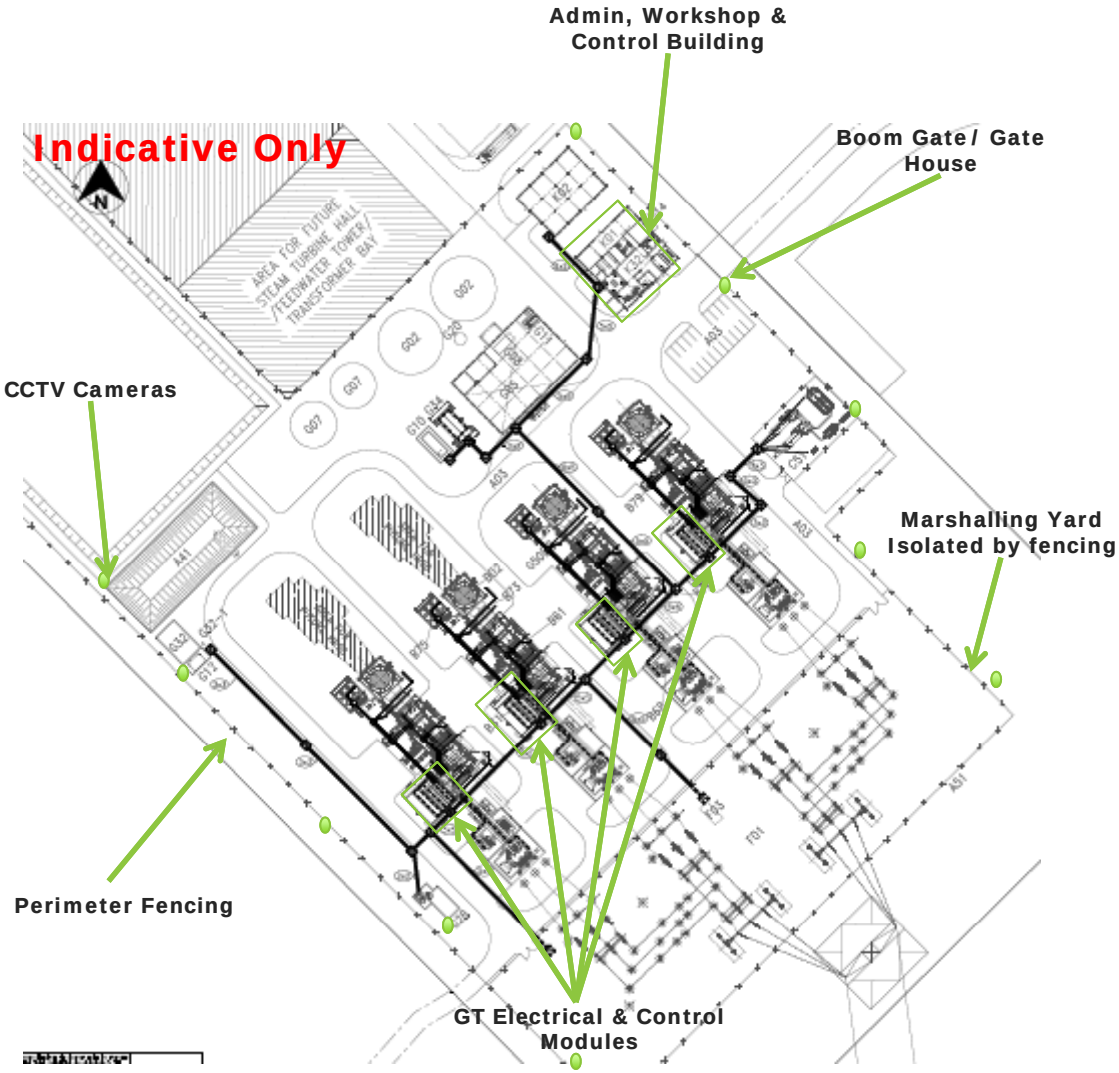
Emergency Response Systems

Graham Dowers, TRUenergy

Site Access, Control, Monitoring and Alarms

Monitoring of Site

- Access to site is via electronic key card system noting user and time of day
- Overall site (GT, Modules, Admin/Control, Workshop, Gatehouse) is monitored by :-
  - series of cameras and intruder alarm systems
  - fire Alarm Detection
    - VESDA - Control Room & Electronic Room
  - Individual unit control monitoring, alarm and protection systems.
- Remote control and monitoring facility has ability to carry out all access, monitoring, control and alarm functions on a 24 hour per day basis



Site Access, Control, Monitoring, Alarms and Protection Systems

Control Systems

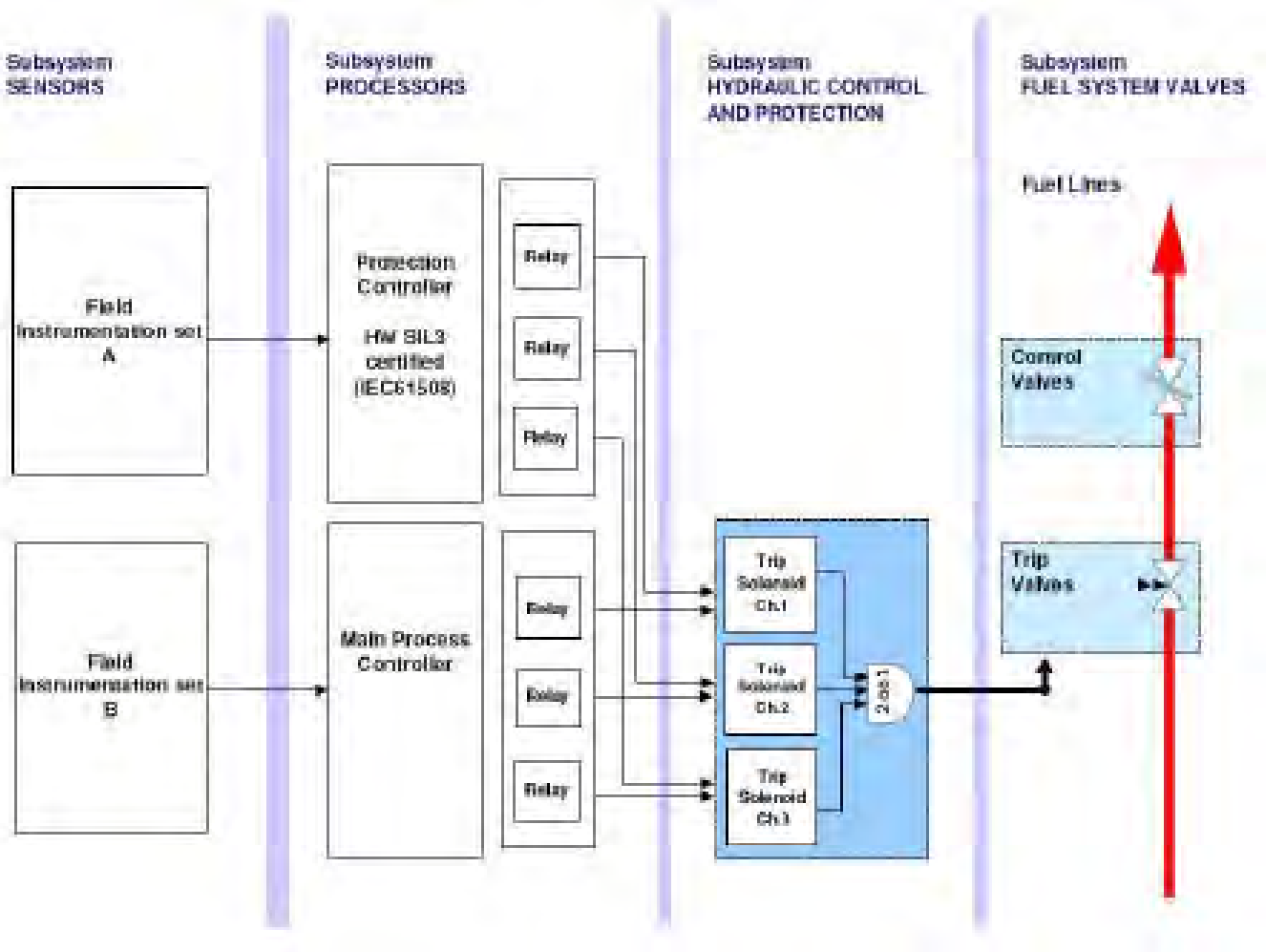
Each Gas Turbine and Generator (Unit) is equipped with its own control system which :-

- Maintains the plant in a state of readiness for operation
- Starts, stops and adjusts its output on command
- Controls fuel and related plant parameters to ensure correct plant operation at all times
- Receives and process's information (binary and analogue) and outputs data for operator review
- Determines when plant is out of safe operating range and raises alarms

Protection Systems

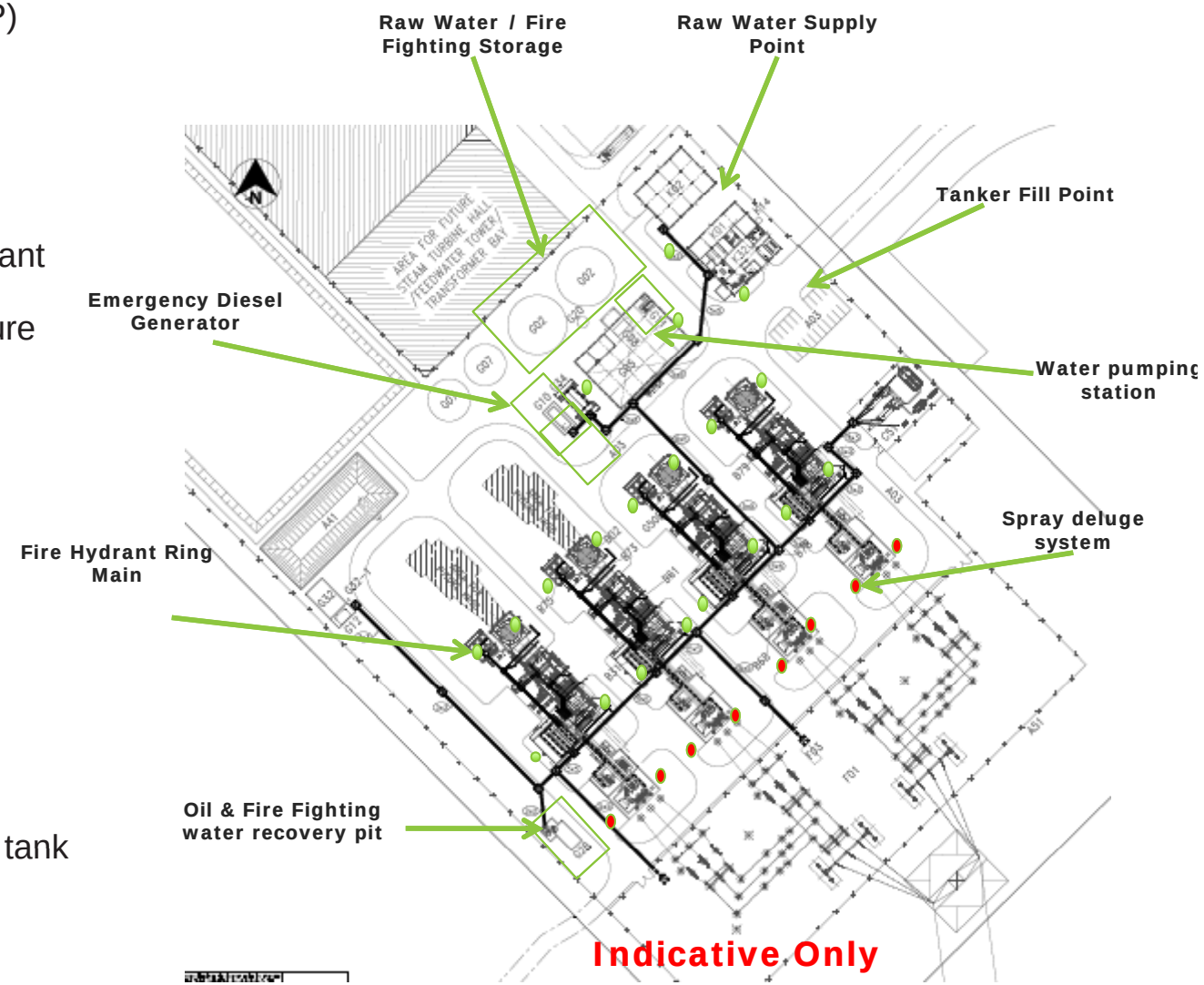
- Each gas turbine, generator and associated equipment is protected for any unexpected events with typical protective inputs included such as:
  - Rotor bearing temperatures, vibration and over speed;
  - Exhaust gas purge failure;
  - Compressor surge, bleed valve failure and inlet guide vein position;
  - Air intake differential pressure, over and under temperature;
  - Turbine inlet temperature out of range flame supervision;
  - Lube oil system supervision;
  - Electrical/Fire/Manual trip
- Resulting protection actions will lead to a power output reduction or in extreme cases a complete shutdown.
- The operator will be informed of an event by alarms.

GT Control Systems Architecture

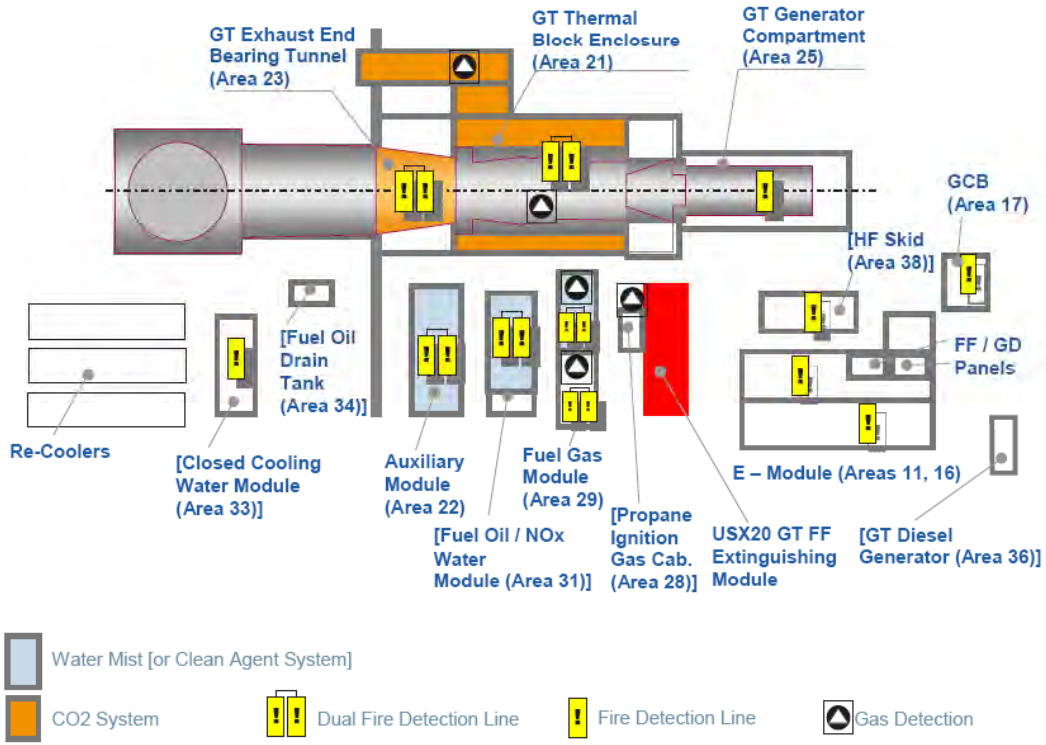


Fire Fighting Equipment on site

- Raw water supply pipe (HSWP)
- 2 x 2500 litre fire water tanks (1200 m3 required)
- Fire Ring Main
  - Overall power plant hydrant coverage
  - Specific building / structure fire water supply.
  - Tanker fill point at Gate
- Fire Water Pump
  - Electrical
  - Diesel
  - Jockey Pump
- Fixed Fire Water Based Extinguishing System
  - Oil filled transformers
  - Fire Pump Station
- Trailer mounted fire pump and tank



4.2 *Figure 1 – Overview Fire Protection Concept*



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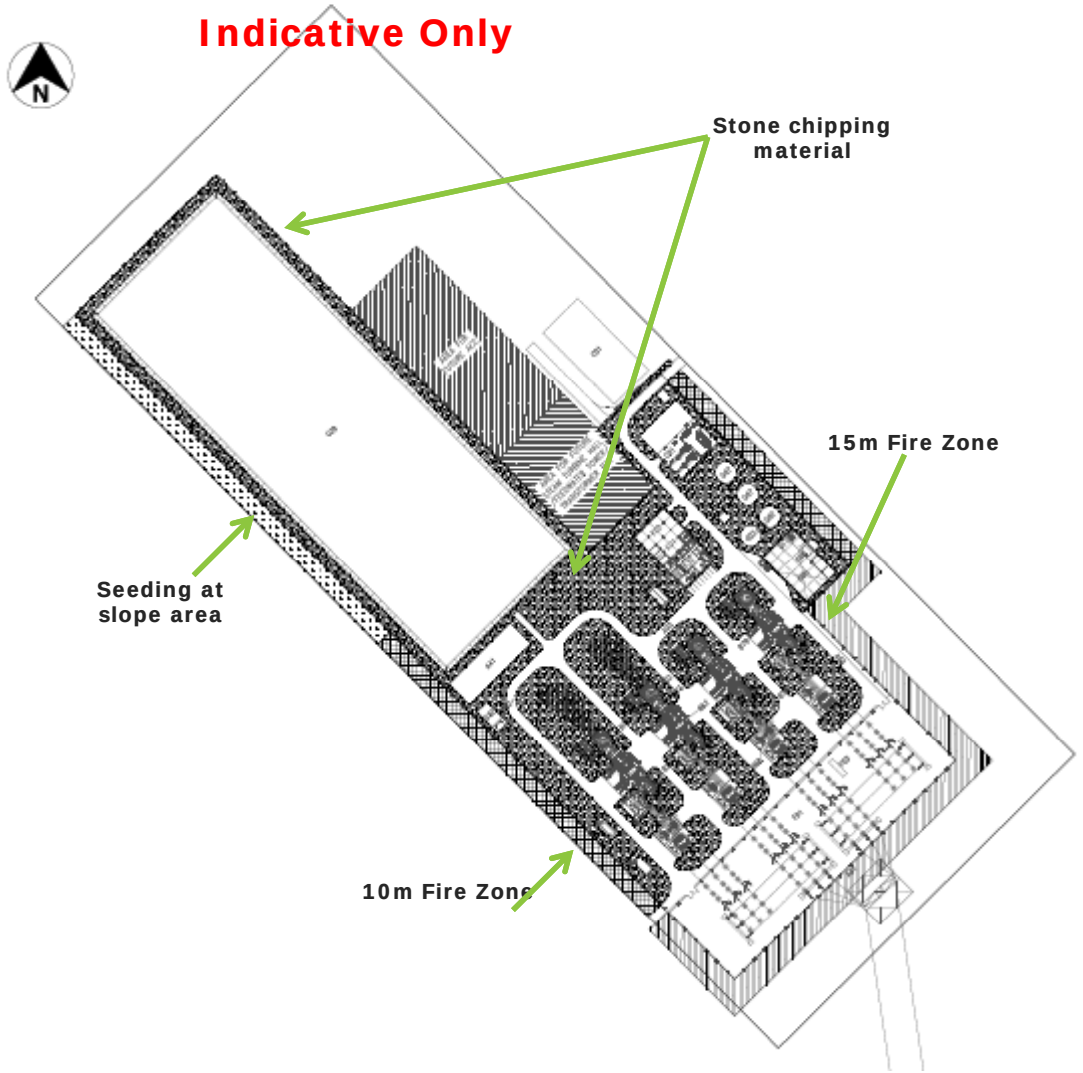
External Threats

- The site is exposed to external threats such as fire, flood and wind. Mitigation of these effects is via a series of engineering controls including:-
  - Design standards such as AS 1170 for weather and seismic effects
  - Raising the site level to 605 m for flooding
  - Providing adequate bypass, sit and cross drainage against flooding
  - Providing perimeter setback (10 - 15m asset protection zone) and material selection against bushfire



Hazard Assessment Process

- **Hazard Analysis –** completed by Delta Energy and Energy Australia and included in the Environmental Assessment.
- **Safety Management System on both Gas and Water Pipelines –** Recently completed by TRUenergy as part of the design phase of the pipelines.
- **Hazard Identification –** Project Engineer (Alstom) currently completing this process which will feed into the detailed design of the plant.
- **Hazard Operations –** The Project Engineering Manager (Alstom) will establish a HAZOP review schedule during the project execution phase (i.e. after Notice to Proceed).
  - HAZOP shall be done according to international standard IEC61882
  - HAZOP study shall demonstrate that prudent steps have been taken to:
    - Check the operating and safety procedures; and
    - Verify that the available protection/safety levels in the system are adequate.
  - HAZOP study is completed before the design is “frozen” to allow changes to the design if required.

Project Management

James Robertson, Alstom

Marulan Power Station Project

CLG Meeting

James Robertson

15 March 2012

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Agenda

1. Introduction
2. Preliminary Construction & Commissioning Schedule
3. Site Manpower during Construction & Commissioning
4. Heavy Load Transport
5. Who is Alstom

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Marulan Power Station Project

ALSTOM

- Owner — TRUenergy, Australia
- EPC Contractor — Alstom
- Location — Marulan, New South Wales
- Plant — 4 x GT13E2 (Open cycle)
- Output — approx. 650 MW
- Application — Peaking
- Fuel — Natural Gas

Based on Alstom GT13E2 Technology

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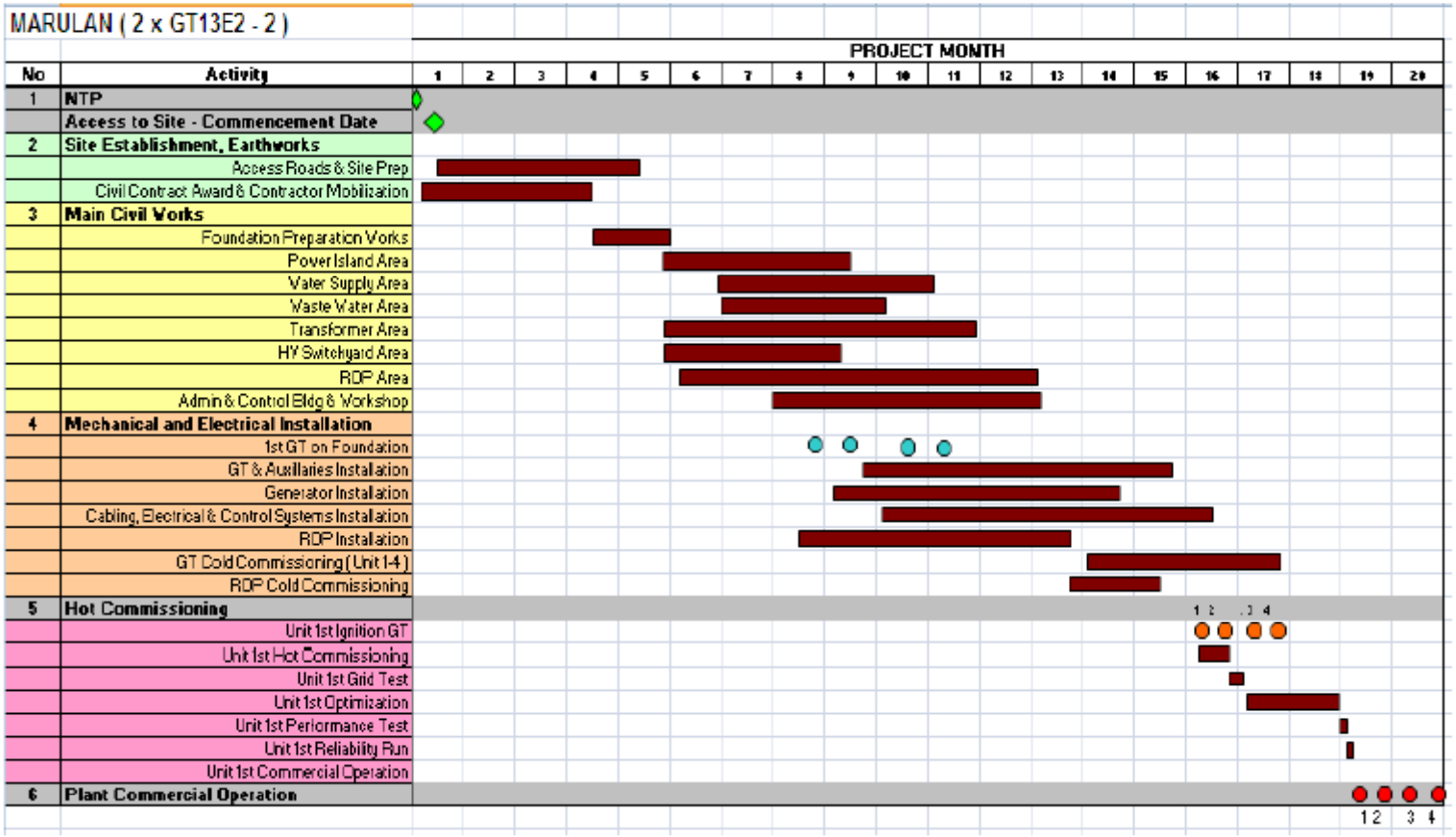
Marulan
Preliminary Construction and Commissioning Schedule

ALSTOM



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Marulan
Estimated Site Manpower during Construction & Commissioning

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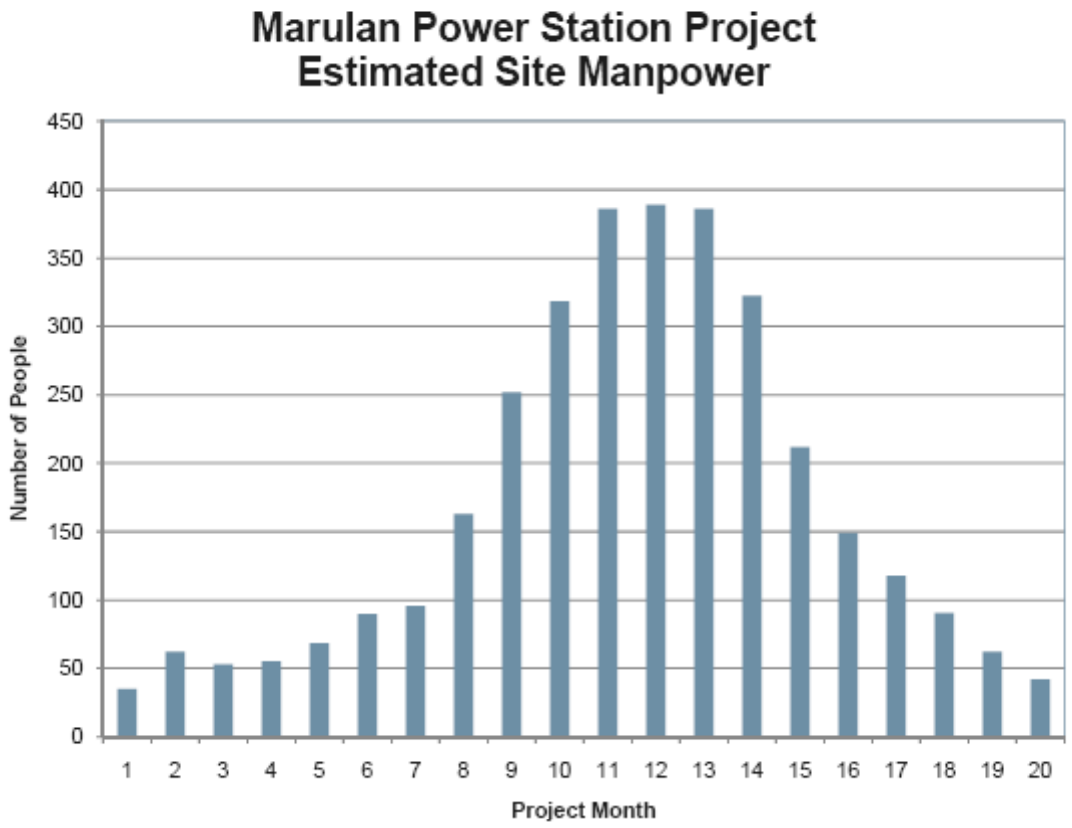

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Marulan
Heavy Load Transport

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4 x Gas Turbine & Auxiliaries

4 x Generator & Auxiliaries

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Alstom
Four main activities

ALSTOM

93,500 employees in 100 countries

Thermal Power Sector
Equipment & services for power generation

Renewable Power Sector
Equipment & services for power generation

Grid Sector
Equipment & services for power transmission

Transport Sector
Equipment & services for rail transport

Four business sectors with a global footprint

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Alstom in Australia and New Zealand:
Examples Gas Turbine Plant References

ALSTOM

Tallawarra, NSW

TRUenergy
420 MW CCPP
Turnkey Power Plant

Colongra, NSW

Delta Electricity
600 MW 2 x GT13E2-2
Turnkey Power Plant

Braemar, QLD

450 MW 3 xGT3E2
Turnkey Power Plant

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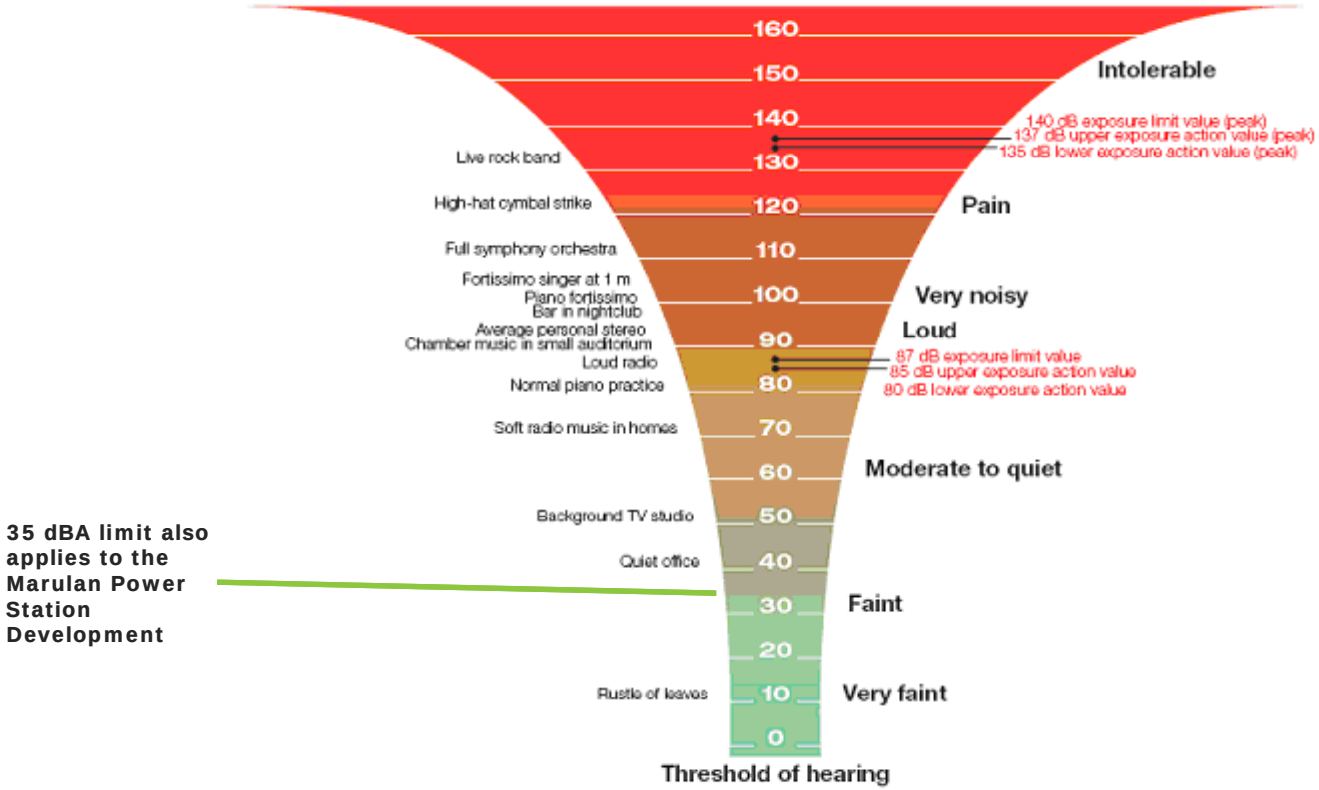
Relative Noise Levels



35 dBA limit also applies to the Marulan Power Station Development

Source: www.soundadvice.info

Item 5: Open Discussion

Item 6: Other Matters

List of Topics for future presentations

Appendices

4 Appendix

4.1 TABLE 1 - Active Fire Protection Measures

Area		Type of Detectors						System					Remarks / Design Parameter
No.	Description	Flame	Heat – Rate of Rise	Heat - Max Temp	Smoke	CLTD	Gas	Automatic CO2	Automatic Water Mist	Portable CO2	Portable Dry Powder	Standpipe & Hose Station	
11	GT Control Module				X					X			[Clean Agent is optional possible]
16	Battery Module				X					X			[Clean Agent is optional possible]
17	Generator Breaker Electrical Cabinet				X					X			
21	GT Thermal Block Enclosure	X	X			X	X	X		X	X	X	CO2 design concentration (initial/extended): 37% for 1min / 34% for 20min
22	GT Auxiliary Module	X	X						X	X	X	X	[Clean Agent instead of Water Mist automatic Extinguishing System is optional possible]
23	GT Exhaust End Bearing Tunnel			X		X		X		X	X	X	CO2 design basis: object protection (local application)
25	GT Generator Enclosure		X		X					X			
[28]	[Ignition Gas Cabinet]						X						
29	Fuel Gas Module	X	X				X		X	X	X		Only for the enclosed parts. [Clean Agent instead of Water Mist automatic Extinguishing System is optional possible]
[31]	[Fuel Oil / NOx Water Module]	X	X						X	X	X	X	[Clean Agent instead of Water Mist automatic Extinguishing System is optional possible]
[33[	[Closed Cooling Water Module]				X					X			
[38]	[HF Skid]				X					X			

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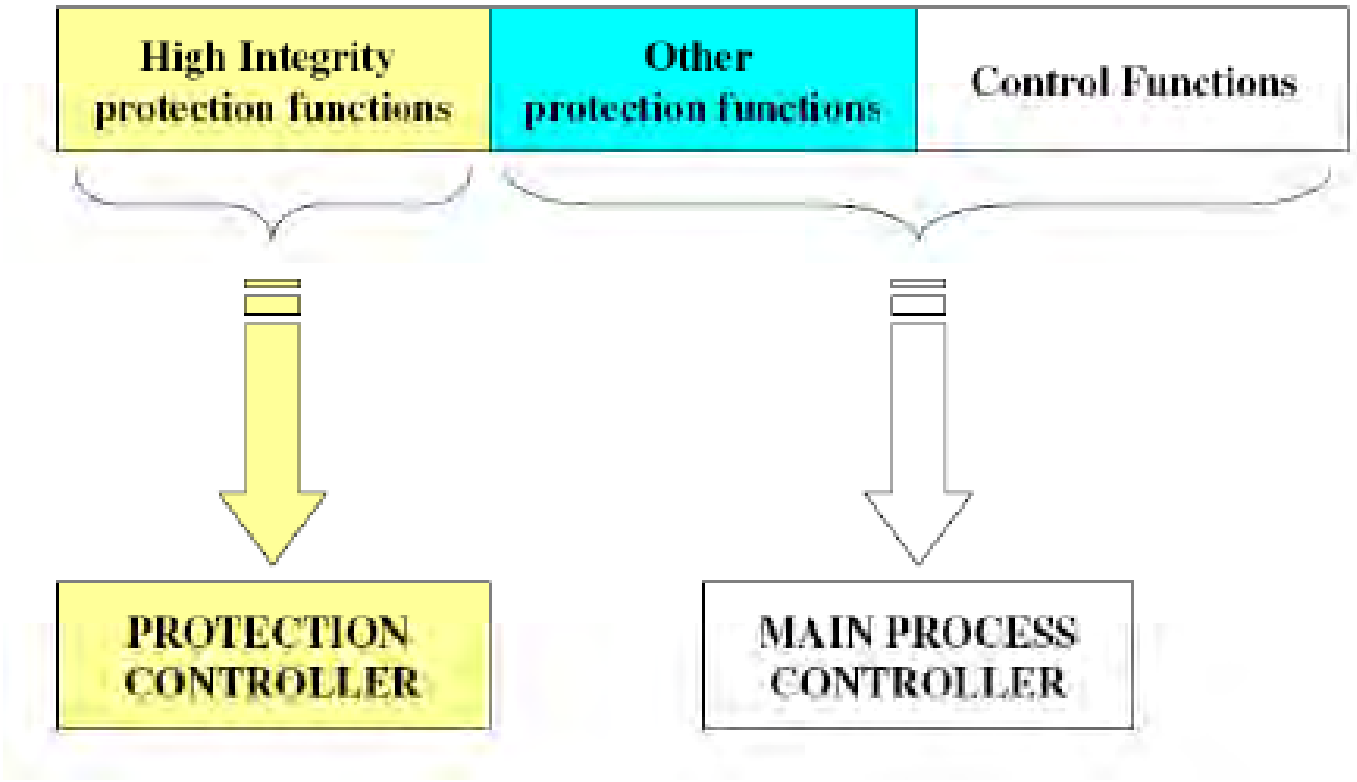
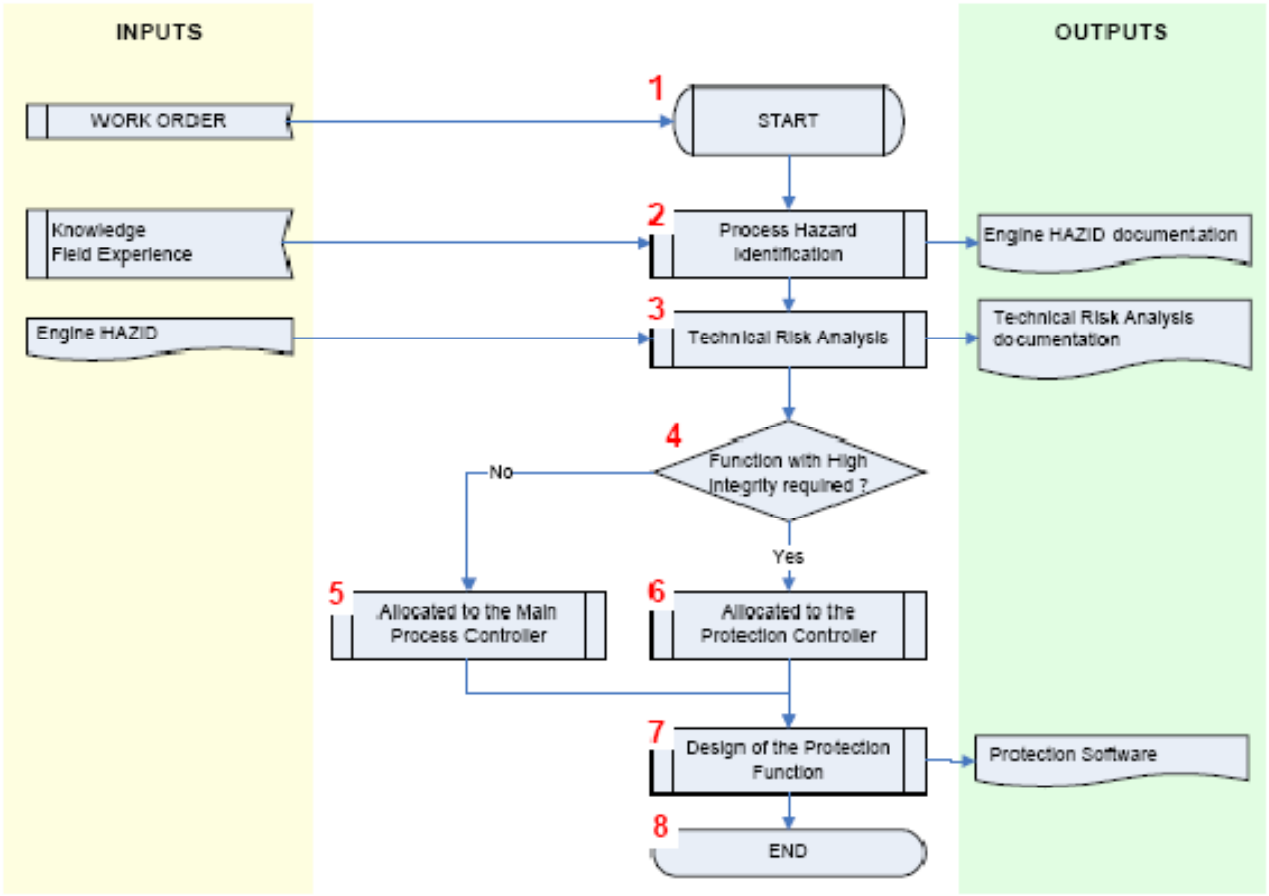

High Integrity
protection functions
Other
protection functions
Control Functions
PROTECTION
CONTROLLER
MAIN PROCESS
CONTROLLER

Hazard Identification Process



HAZOP

5.3. Attachment 3: HAZOP and Risk Matrix

	CATEGORIES								LIKELIHOOD						
SEVERITY	Impact to Personnel Health & Safety (P-H&S)	Impact to General Public (G)	Impact to Environment (E)	Equipment Loss/ Production Loss (F)					Very Frequent (A)	Frequent (B)	Probable (C)	Occasional (D)	Remote (E)	Improbable (F)	Extremely Improbable (G)
				Repair Cost	Outage Time	Effect	Financial loss								
	No injury	No noticeable hazard	No damage	no repair necessary	Restart after trip/ shutdown required	No Damage	less than 100 K Euros	1 Insignificant (I_N)							
	Minor injury	A noticeable hazard, may be remarked by public	Release within the fence with minor damage, not to be reported	less than 50 K Euros	less than 6 hours	Minor Damage to Equipment	Between 100 to 250 K Euros	2 Minor (M_N)							
	Severe injury	A Severe hazard, noticeable injury/'s	Release within the fence with significant damage, which should be reported	50 to 0.5 M Euros	6 hours to 3 days	Moderate Damage to Equipment	Between 250 K Euros to 1.5 M Euros	3 Serious (S_N)							
	Fatality (< 10)	Serious injury, may cause fatality	Release outside the fence with temporary damage	0.5 to 5 M Euros	between 6 and 24 days	Major Damage to Equipment	Between 1.5 M Euros to 10 M Euros	4 Extensive (E_N)							
	Catastrophe, many fatalities (> 10)	Fatality (< 10)	Release outside the fence with long-term major damage	more than 5 M Euros	more than 24 days (Forced outage)	Extensive Damage to Equipment	More than 10 M Euros	5 Catastrophic (C_N)							

	RISK TYPE	DESCRIPTION
	Very Low Risk (V. LR)	The risk could be considered as being acceptable
	Low Risk (LR)	The risk requires no neccessary follow-up, acceptable risk
	Medium Risk (MR)	Necessary measures to be addressed/action obligatory
	High Risk (HR)	Additional safeguards/measures have to be applied
	Extreme Risk (ER)	Control measures to be taken into account, to reduce the risk

Very Frequent (A)	More than 10 occurrences per year per Power train
Frequent (B)	1 to 10 occurrences per year per Power train.
Probable (C)	May occur once in 1 to 10 years per Power train.
Occasional (D)	May occur once in 10 to 100 years per Power train.
Remote (E)	May occur once in 100 to 1,000 years per Power train.(or less than once per year in a fleet of 100 Power trains)
Improbable (F)	May occur once in 1,000 to 10,000 years per Power train.(or less than once in 10 years in a fleet of 100 Power trains)
Extremely Improbable (G)	May occur once in > 10,000 years per Power train.(or less than once in 100 years in a fleet of 100 Power trains.)

Site Boundary

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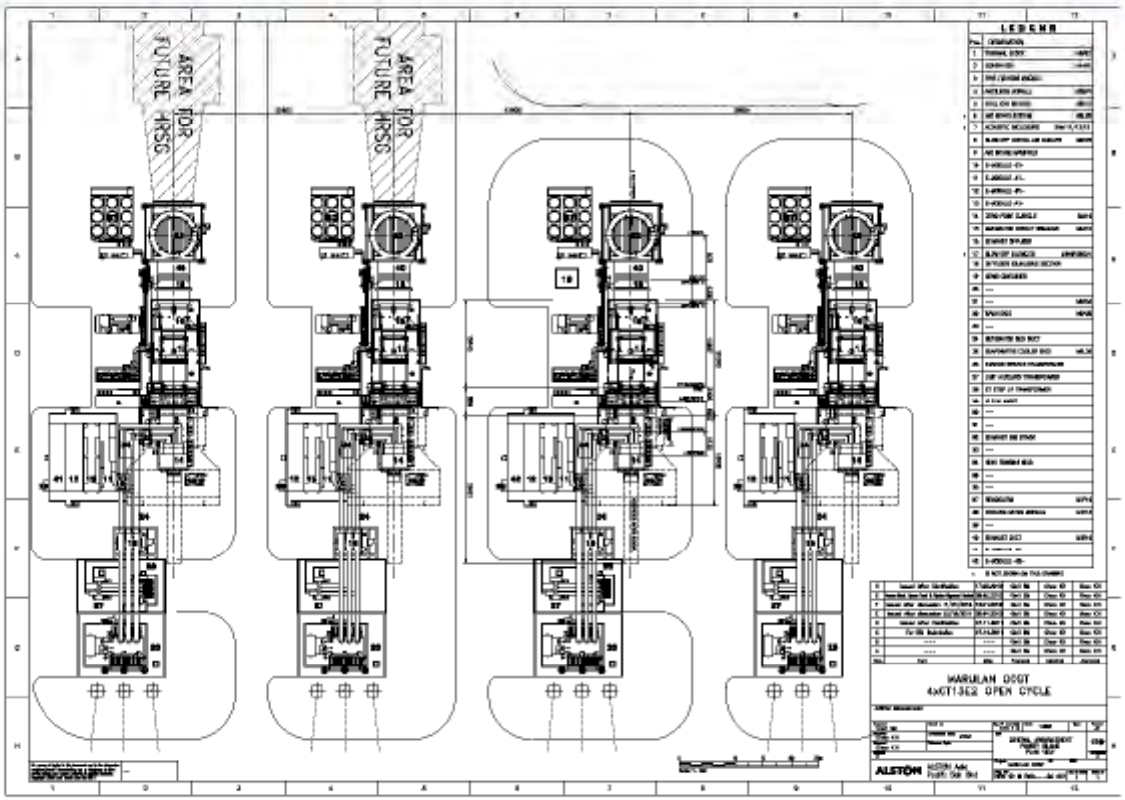
Plant Arrangement



Power Island

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Power
Present in all markets

ALSTOM

Technologies adapted to all major energy sources

Gas

Coal

Oil

Hydro

Nuclear (Conventional island)

Wind

Solar

Geothermal

Biomass

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