
# FITNESS FOR PURPOSE REPORT 2002 for Pipeline Licence No 1 MOOMBA TO ADELAIDE PIPELINE

**Document Number JDK-TR-1009-01**

**February 2003**

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| AS2885 | Australian Standard 2885<br>Pipelines, gas and liquid petroleum |
| CFS | Country Fire Service |
| CP | Cathodic Protection |
| CPU | Cathodic Protection Unit |
| Cu/cuSO4 | Copper/Copper Sulphate |
| EMS | Environmental Management System |
| ESD | Emergency Shutdown |
| GPS | Geographical Positioning System |
| HAZOP | Hazard Operability |
| HMI | Human Machine Interface |
| HSE | Health, Safety & Environment |
| LMS | Land Management System |
| MAP | Moomba to Adelaide Pipeline |
| MFS | Metropolitan Fire Service |
| MLV | Mainline Valve |
| PIRSA | Primary Industries and Resources of South Australia |
| PL1 | Pipeline Licence no 1 |
| ROW | Right of Way |
| RTU | Remote Terminal Unit |
| SCADA | Supervisory Control and Data Acquisition |
| SEO | Statement of Environmental Objectives |
| SES | State Emergency Service |
| SMS | Safety Management System |
| SRB | Sulphate Reducing Bacteria |
| SWER | Single Wire Earth Return |
| UHF | Ultra High Frequency |
| VHF | Very High Frequency |
| PLC | Programmable Logic Controller |

# 1. EXECUTIVE SUMMARY

The Moomba to Adelaide Pipeline is owned, operated and maintained by Epic Energy. This pipeline system is licensed under Pipeline Licence 1. The Petroleum Act 2000 requires a Fitness for Purpose Report to be completed for the Moomba to Adelaide Pipeline at five-yearly intervals.

The Moomba to Adelaide Pipeline is 781km long and 559mm in diameter, constructed of welded steel wrapped in a protective coating and is buried to depths in excess of 800 mm. The pipeline system has an external corrosion prevention system to protect the buried pipeline from corrosion.

There are seven gas turbine driven compressor stations located about 100km apart and mainline valves are installed approximately every 32kms. After-coolers are provided at the compressor stations to reduce the risk of stress fracture or over-temperature of the pipeline coating.

The pipeline was designed for the express purpose of transporting Natural Gas and operates at a Maximum Operating Pressure of 7.3MPa.

The Moomba to Adelaide Pipeline has been progressively upgraded to boost capacity and increase security of gas supplies. This includes a 43km loop line of 510mm diameter between Wasleys the Torrens Island Power Station.

A detailed Risk Assessment of the Pipeline System was completed by Epic Energy in March 2002. Hazardous Operability studies have been completed on 90% of above ground facilities, with the remainder to be completed during the first quarter of 2003. Actions arising from these studies and the Risk Assessment are progressively being closed out.

The last Emergency Response Exercise “Exercise Moomba” was carried out in 1$^{st}$ October 2002.

Intelligent pigging of the MAP was commenced in May 2002 and will be completed early in 2003.

Based on the physical assessment of the Pipeline, a review of the management systems governing the manner in which the Pipeline is operated and maintained and all other relevant information, the Moomba to Adelaide Pipeline is assessed as being in good condition and fit for current and future purpose, for at least the next five years.

# 2. FACILITY DESCRIPTIONS

The Petroleum Act 2000 requires a Fitness for Purpose Report to be completed for the Moomba to Adelaide Pipeline at five-yearly intervals. This Report must be submitted to the regulatory authority, Primary Industries and Resources South Australia for approval.

The Moomba to Adelaide Pipeline transports un-odorised natural gas for industrial, commercial and domestic customers in Adelaide. A network of Laterals supply similar customers from Whyalla to Angaston and Peterborough to Dry Creek. Gas is also supplied to the Beverley Lateral (owned by Heathgate Resources) and the Riverland Pipeline (owned by Envestra).

The design parameters and description of the facilities for the Moomba to Adelaide Pipeline are provided in the following sections.

## 2.1. PIPELINES

### 2.1.1. MAINLINE MOOMBA TO ADELAIDE

| | |
|---|---|
| Date Constructed | 1967/68 |
| Date Commissioned | 1969 |
| Length, km | 781 |
| Diameter (OD), mm | 558.9 |
| Wall Thickness, mm:<br>- Normal<br>- Special Crossings (eg: rivers, roads, railways)<br>- MLV's | <br>7.92<br>9.50<br>9.50 |
| Pipe Grade | API 5L X52 |
| Pipe Supplier | - |
| MAOP, kPa | 7,322 (6,100 Wasleys to TI) |
| Fluid | Natural Gas |
| Material | High tensile steel |
| Coating | Plicoflex Tape |
| Minimum cover, mm | 1000 |
| Main Line Valves | 34 |
| Scraper Stations | 9 |
| Compressor Stations | 7 |
| Meter Stations | 28 |

### 2.1.2. MAINLINE LOOPING

| | |
|---|---|
| Date Constructed | 2000 |

| | |
|---|---|
| Date Commissioned | 2000 |
| Length CS01 Loop 1, km | 5.193 |
| Length CS02 Loop 2, km | 9.995 |
| Length CS03 Loop 3, km | 13.278 |
| LengthCS04 Loop 4, km | 5.961 |
| Diameter (OD), mm | 600 |
| Wall Thickness, mm:<br>- Loops 1 to 3<br>- Loop 4 | <br>7.14<br>8.74 |
| Pipe Grade | API 5L X65 |
| Pipe Supplier | Tubemakers |
| MAOP, kPa<br>Loops 1 to 3<br>Loop 4 | <br>7,322<br>8,740 |
| Fluid | Natural Gas |
| Coating | FBE |

### 2.1.3. MAINLINE KP 731.8 TO TORRENS ISLAND

(Wasleys Loop)

| | |
|---|---|
| Date Constructed | 1986 |
| Date Commissioned | September 1986 |
| Length, km | 42.0 |
| Diameter (OD), mm | 508 |
| Wall Thickness, mm: | 9.0 |
| Pipe Grade | API 5L X60 |
| Pipe Supplier | One Steel |
| MAOP, kPa | 7,322 |
| Fluid | Natural Gas |
| Coating | FBE 400 |
| Main Line Valves | 6 |
| Actuators | 5 |
| Scraper Stations | 0 |
| Meter Stations | 6 |

### 2.1.4. MAINLINE KP 559.8 TO PETERBOROUGH

(Peterborough Lateral)

| | |
|---|---|
| Date Constructed | 1972 |
| Date Commissioned | 1972 |
| Length, km | 1.9 |
| Diameter (OD), mm | 88.9 |
| Wall Thickness, mm: | 4.78 |
| Pipe Grade | ASTM A53 Gr.B |
| Pipe Supplier | - |
| MAOP, kPa | 690 |
| Fluid | Natural Gas |
| Coating | Armathene |

### 2.1.5. MAINLINE KP 590.0 TO PORT PIRIE

(Port Pirie Lateral)

| | |
|---|---|
| Date Constructed | 1975-1976 |
| Date Commissioned | 1976 |
| Length, km | 77.8 |
| Diameter (OD), mm | 168.3 |
| Wall Thickness, mm: | 4.37 |
| Pipe Grade | API 5L Gr.B |
| Pipe Supplier | - |
| MAOP, kPa | 8,240 |
| Fluid | Natural Gas |
| Coating | Pilcoflex PVC |

### 2.1.6. MAINLINE KP 640.5 TO BURRA

(Burra Lateral)

| | |
|---|---|
| Date Constructed | 1974 |
| Date Commissioned | 1974 |
| Length, km | 15 |
| Diameter (OD), mm | 88.9 |
| Wall Thickness, mm: | 4.78 |
| Pipe Grade | API 5L Gr.B |
| Pipe Supplier | - |
| MAOP, kPa | 7,322 |
| Fluid | Natural Gas |
| Coating | Yellow Jacket |

### 2.1.7. MAINLINE KP 665.2 TO MINTARO

(Mintaro Lateral)

| | |
|---|---|
| Date Constructed | 1984 |
| Date Commissioned | 1984 |
| Length, km | 5.5 |
| Diameter (OD), mm | 219.1 |
| Wall Thickness, mm: | 4.77 |
| Pipe Grade | API 5L X42 |
| Pipe Supplier | - |
| MAOP, kPa | 7,322 |
| Fluid | Natural Gas |
| Coating | FBE |

### 2.1.8. MAINLINE KP 731.8 TO ANGASTON

(Angaston Lateral)

| | |
|---|---|
| Date Constructed | 1969 |
| Date Commissioned | 1969 |
| Length, km | 38.7 |
| Diameter (OD), mm | 219 |
| Wall Thickness, mm: | 4.78 |
| Pipe Grade | API 5L X42 |
| Pipe Supplier | - |
| MAOP, kPa | 7,322 |
| Fluid | Natural Gas |
| Coating | Plicoflex PVC |

### 2.1.9. MAINLINE KP 769.7 TO PELICAN POINT

(Pelican Point Lateral)

| | |
|---|---|
| Date Constructed | 2000 |
| Date Commissioned | 2000 |
| Length (river), km | 0.855 |
| Length (land), km | 1.007 |
| Diameter (OD), mm | 356 |
| Wall Thickness, mm: | 7.1 |
| Pipe Grade | API 5L X52 |
| Pipe Supplier | One Steel |
| MAOP, kPa | 9600 |
| Fluid | Natural Gas |
| Coating - river | 400 micron FBE plus Powercrete |
| Coating - land | 400 micron FBE |

### 2.1.10. MAINLINE KP 771.9 TO OSBORNE CO GEN

(Osborne Lateral )

| | |
|---|---|
| Date Constructed | 1998 |
| Date Commissioned | 1998 |
| Length (river), km | 0.852 |
| Length (land 1), km | 1.31 |
| Length (land 2), km | 0.188 |
| Dia (OD river), mm | 273.1 |
| Dia (OD land 1), mm | 273.1 |
| Dia (OD land 2), mm | 219.1 |
| Wall Thk. (river), mm: | 604 |
| Wall Thk. (land 1) | 9.2 |
| Wall Thk. (land 2) | 4.0 |
| Pipe Grade | API 5L X42 |
| Pipe Supplier | BHP |
| MAOP, kPa | 10,000 |
| Fluid | Natural Gas |
| Coating - river | FBE concrete coated |
| Coating - land | Yellow jacket |

### 2.1.11. MAINLINE KP 773.5 TO ETSA AT DRY CREEK

(Cry Creek Lateral)

| | |
|---|---|
| Date Constructed | 1970-1971 |
| Date Commissioned | 1971 |
| Length, km | 1.3 |
| Diameter (OD), mm | 323.9 |
| Wall Thickness, mm: | 9.53 |
| Pipe Grade | API 5L X42 |
| Pipe Supplier | - |
| MAOP, kPa | 2,067 |
| Fluid | Natural Gas |
| Coating | Yellow Jacket |

### 2.1.12. MAINLINE KP 781.2 TO TAPEROO

(Taperoo Lateral)

| | |
|---|---|
| Date Constructed | 1969 |
| Date Commissioned | 1969 |
| Length, km | 1.2 |
| Diameter (OD), mm | 323.9 |
| Wall Thickness, mm: | 9.53 |
| Pipe Grade | API 5L X42 |
| Pipe Supplier | - |
| MAOP, kPa | 7,322 |
| Fluid | Natural Gas |
| Coating | Double wrap coal tar epoxy concrete coated |

### 2.1.13. WHYALLA LATERAL KP 64.7 TO PORT BONYTHON

(Port Bonython Lateral)

| | |
|---|---|
| Date Constructed | 1988-1989 |
| Date Commissioned | 1989 |
| Length, km | 5.5 |
| Diameter (OD), mm | 168.3 |
| Wall Thickness, mm: | 4.1 mm to Kp 5.43 and 4.8 mm from there on |
| Pipe Grade | API 5L X42 |
| Pipe Supplier | - |
| MAOP, kPa | 7,322 |
| Fluid | Natural Gas |
| Coating | Polyken 2 layer tape |

### 2.1.14. PORT PIRIE LATERAL AT BUNGAMA TO WHYALLA

(Whyalla Lateral)

| | |
|---|---|
| Date Constructed | 1988-1989 |
| Date Commissioned | 1989 |
| Length, km | 87.8 |
| Diameter (OD), mm | 219.1 |
| Wall Thickness, mm: | 4.30 |
| Pipe Grade | API 5L X52 |
| Pipe Supplier | - |
| MAOP, kPa | 10,130 |
| Fluid | Natural Gas |

### 2.1.15. ANGASTAN LATERAL TO NURIOOTPA

(Nuriootpa Lateral)

| | |
|---|---|
| Date Constructed | 1972 |
| Date Commissioned | 1972 |
| Length, km | 1.6 |
| Diameter (OD), mm | 114.3 |
| Wall Thickness, mm: | 4.78 |
| Pipe Grade | ASTM A53 Gr.B |
| Pipe Supplier | - |
| MAOP, kPa | 1,379 |
| Fluid | Natural Gas |
| Coating | Armathene |

### 2.1.16. WHYALLA LATERAL LOOP - DOUGLAS POINT TO MAMBRAY CREEK

| | |
|---|---|
| Date Constructed | 1988-1989 |
| Date Commissioned | 1989 |
| Length, km | 11.5 |
| Diameter (OD), mm | 114.3 |
| Wall Thickness, mm: | 4.3 |
| Pipe Grade | API 5LX 52 |
| Pipe Supplier | - |
| MAOP, kPa | 10.130 |
| Fluid | Natural Gas |
| Coating | Polyken 2 layer Tape and 25 mm concrete coating at crossings. |

## 2.2. MOOMBA

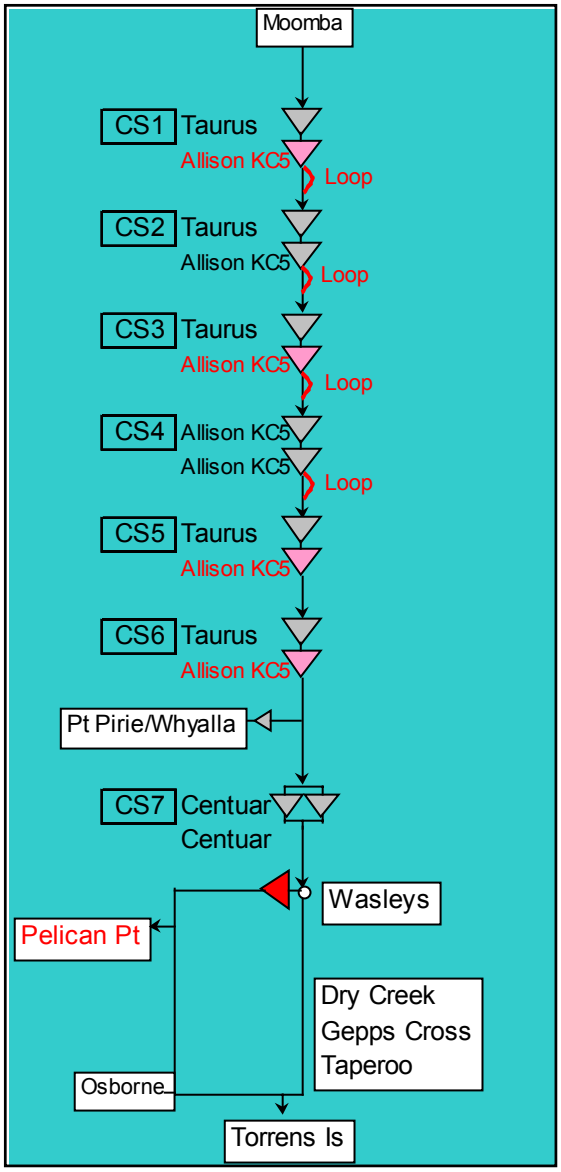
A Project by Santos took place in 2002 for the installation of new gas chromatographs, sulphur and moisture analysers and a modern PLC based flow computer system. The upgrade was instigated to replace their existing FOX 300 flow computer, Westinghouse plant SCADA, chart recorders and printers, calorimeters, densitometers and other equipment, which is considered obsolete, or is no longer capable of being supported.

The existing configuration of three switchable meter tubes incorporating orifice plate measurement remains untouched.

The upgrade consisted of the installation of:

- Two Daniel Danalyser Model 590 Gas Chromatographs (GCs).
- Two Galvanic Applied Science Model 902 Sulphur Analysers.
- Two Ametek Model OLV3050 Moisture Dewpoint Analysers.
- Sample Gas Conditioning System and analyser auto-calibration facility.
- Dual-redundant Emerson (Fisher Rosemount) Delta V Flow Computer and associated workstations running proprietary software under NT 4.0 SP 6 OS on plant Ethernet LAN with firewall to SANTOS Corporate LAN.
- New Fieldbus wiring and transmitters for fiscal measurands.
- Un-interruptible Power Supply system to supply secure 240V AC to critical system.

## 2.3. COMPRESSOR STATIONS




**Physical Layout of the Moomba to Adelaide Pipeline (MAP)**

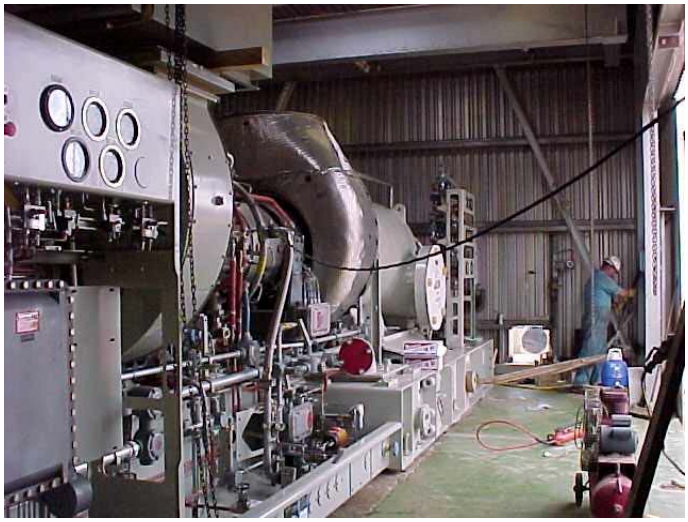
There are 7 turbine driven Compressor Stations on the Moomba to Adelaide Pipeline situated approximately 92km apart and reciprocating compressors at the inlet to the Port Pirie/Whyalla Lateral and Wasleys Loop.

### 2.3.1. COMPRESSOR STATIONS

In 1998, the MAP Compressor Stations underwent a major upgrade of their compression equipment. This included the replacement of the Solar Centaur packages at stations 1, 2, 3, 5 & 6 with Solar Taurus units and the upgrade of 3 of the Ingersol Rand packages from a horsepower capacity of 4,250 to 5,400.

At the same time the station control system was upgraded from an antiquated electro–mechanical system to an Allen Bradley PLC.

The pipeline was further enhanced in 2000 by the construction of 34kms of 24' loops south of stations 1, 2, 3 & 4 and the remaining 4 Ingersol Rand packages being upgraded to the higher horsepower specifications.



**Installation of the Taurus package**

A further major undertaking in 2000 was the installation of a reciprocating compressor at Wasleys.

Compressor Stations 1-7 consist of typically a MLV and Scraper Station facility, Station Suction and Discharge valve assemblies with the components downstream of these valves arranged as follows:

- Main Station pipework consisting of 550mm NB.
- A Centrifugal Gas Scrubber Assembly.
- A Suction Header incorporating two John's 550mm Check Valves.
- Valving from this Suction Header routes gas through two Gas Turbines driving Boost Process Compressors as dictated by operational requirements.
- A Discharge Header which passes the gas through an aftercooler assembly to remove excess heat from the compressed gas.
- A metering run consisting of an orifice plate, pressure and temperature measurement and a ΔP transmitter to measure the gas flow through the station.
- A Station Vent Valve Assembly for over pressure protection and to provide an ESD facility.
- Incorporated within the Station compound are a services building housing the Control Room, Battery Room, Workshop and Store facility and a power house typically consisting of three Gas driven Engine Alternator sets.

Some of the unique features of these stations are described in the following paragraphs.

**CS 1 - 3**

Equipment details installed at this site are as follows:

- The station is controlled via an Allen–Bradley PLC housed in the Station Control Room. This PLC interfaces between TSCC via SCADA and the on-site HMI and processes all station and unit controls including set point changes for process control.
- The power generation capability at this site consists of three gas driven engine alternator sets of a nominal capacity of 90 kW.
- GEA 1 & 2 are Caterpillar 68D driven machines direct coupled to a Stamford alternator with on board voltage regulation.
- GEA 3 is a Caterpillar 7Y machine direct coupled to a Caterpillar alternator, again with on board voltage regulation.
- All of these machines are capable of stand-alone operation or can be parallelled to each other to give a total capacity of a nominal 270 kW.
- These machines are controlled by an Intelligen engine management control system.

**CS4**

- The power generation capability at this site consists of three gas driven engine alternator sets. GEA 1 & 2have a nominal capacity of 90 kW and GEA 3 has a nominal capacity of 160 kW.
- GEA 1 & 2 are Waukesha driven machines direct coupled to a Dunlite alternator with on board voltage regulation.
- GEA 3 is a Waukesha machine direct coupled to a Stamford alternator, again with on board voltage regulation.
- All of these machines are capable of stand-alone operation or can be parallelled to each other to give a total capacity of a nominal 340 kW.
- These machines are controlled by Intelligen engine management control system.

**CS 5 & 6**

As for CS1, except for power generation at this site which consists of:

- GEA 1 is a Caterpillar 68D driven machine direct coupled to a Caterpillar alternator with on board voltage regulation. The controls for this machine are handled by an electro-mechanical control system.
- GEA 2 is a Caterpillar engine alternator set in an acoustic canopy and is a stand-alone unit. These sets cannot be run in parallel.

**CS7**

- This station is unique, in that it is a parallel station consisting of Suction and Discharge headers which are remote from each other. Gas flow through the station is through either or both units with the MLV being open when the station is not operational.
- Power generation at this site is by a Caterpillar 68D driven machine direct coupled to a Caterpillar alternator with on board voltage regulation. The controls for this machine are handled by an electro-mechanical control system. This machine acts in a stand-by to mains capacity as the site is serviced by a SWER line from the power grid.

### 2.3.2. COMPRESSORS

**CS 1, 2, 3, 5 & 6**

Compression at these stations consists of two Gas Turbine Compressor sets. Both of these units are housed in separate designed for purpose buildings.

- **A Unit:** This is a Solar Taurus unit driving a single wheel compressor with a nominal ISO rating of 6,900 HP.

  This package is controlled by a Solar Turbotronics PLC based engine/compressor management system.
- **B Unit:** This is an Ingersol Rand package consisting of an Alison gas turbine driving a 4-wheel compressor.

  This package is controlled by an IECS analogue control system.

**CS4**

Compression at these stations consists of two Gas Turbine Compressor sets. Both of these units are housed in separate designed for purpose buildings.

- **A Unit:** This is an Ingersol Rand package consisting of an Alison gas turbine driving a 4-wheel compressor.

  This package is controlled by an IECS analogue control system.

  Both of these units are housed in separate designed for purpose buildings.
- **B Unit:** This is an Ingersol Rand package consisting of an Alison gas turbine driving a 4-wheel compressor.

  This package is controlled by an IECS analogue control system.

**CS7**

Compression at these stations consists of two Gas Turbine Compressor sets. Both of these units are housed in separate designed for purpose buildings.

- **Both A & B unit** at this site are Solar Centaurs with a Process Compressor which is capable of being run either in series or parallel configuration.

### 2.3.3. PIG LAUNCHERS/RECEIVERS

Pig Launcher/Receiver assemblies are located at all Compressor Stations. The receiver and launcher barrels are 600mm NB and connected to the Mainline via a 508mm long conical reducer.

Both Launcher and Receiver are equipped with a quick opening, horizontally hinged, swing Unibolt Closure equipped with safety interlock.

All Launcher/Receiver assemblies are equipped with kicker lines complete with associated valving to enable pigging operations and to ensure pipeline flow can be accommodated through these lines without significantly causing any throttling effect on pipeline operations.

Launchers and Receivers are isolated from the Mainline via W.K.M. “Saf-T-Seal” round body, through conduit, gate valves.

## 2.3.4. SCRUBBERS

Centrifugal gas scrubbers are installed at CS 1 - 6. Gas enters the tube bundle tangentially, creating a high centrifugal force that projects solids and liquids to the walls of the tubes, allowing clean gas to pass through the scrubber and waste impurities to be collected in the Dust Collector vessel, located below the scrubber. The Station PLC cycles the Scrubber valves automatically twice every 24 hours, to eject the contents of the Dust Collector into the below ground Scrubber Tank.

Dual Filter Coalescer assemblies are installed at CS7, which filter process gas passing through the station. These Filter Coalescer units are equipped with a liquids Level Controller which automatically dumps any liquids collected, to a collection tank, at a pre-determined level in the collector.

## 2.3.5. AFTERCOOLERS

Aftercooling at CS 1 - 6 is achieved by the process gas passing through two banks of finned tubes over which forced air is passed by two electrically driven 4.88 metre diameter fans.

Aftercooling at CS7 is achieved via the process gas passing through banks of finned tubes over which forced air is passed by two hydraulically driven polypropylene fans. The power for these fans comes from the Centaur unit accessory drive gearbox.

## 2.3.6. WHYTE YARCOWIE COMPRESSOR STATION

This station consist of a MLV and Scraper Station facility for the 150mm NB Pt Pirie lateral, Station Suction and Discharge valve assemblies feeding suction and discharge headers. Components downstream of these valves are arranged as follows:

- Main Station pipework consisting of 150mm NB linepipe.
- Valving from this Suction Header routes gas through a compressor package.
- The discharge gas from the Ariel compressor passes through an aftercooler assembly, which is mounted on the compressor package and is engine driven, to remove excess heat from the compressed gas.
- There is a hydrocarbon waste collector tank which collects hydrocarbons from the filter coalescer assays on the unit suction and discharge.
- A metering run measures the gas flow through the station.
- A Station Vent Valve Assembly for the over pressure protection and to provide an ESD facility.
- Incorporated within the Station compound are a services building housing the Control Room, Battery Room, Workshop and Store facility.

**COMPRESSOR**

- The compressor package consists of a Waukesha F3521G turbo charged gas engine driving an Ariel JGR/2 reciprocating compressor as dictated by operational requirements.

### 2.3.7. ANGASTON COMPRESSOR STATION

Epic Energy own and operate an electric motor driven compressor, located at inlet of the Riverland Pipeline System at the Angaston meter station.

For environmental reasons, the compressor is not depressurised or blown down when stopped or shut down, except in an ESD situation.

The unit has two relief valves, fast & slow. The fast one is always kept closed except when an ESD exists, the slow one is used to depressurise the unit to 900 kPa during start up.

The compressor unit has a capacity of 8280 kPa maximum working pressure and the relief valves are set at 8620 kPa.

**COMPRESSOR**

- The Gemini HPD model compressor consisting of 2 cylinder reciprocating compressor driven by a 150 kW/200 HP electric motor with a flow capacity of 5200 standard cubic meters per hour.

### 2.3.8. WASLEYS COMPRESSOR STATION

The Wasleys Compressor Station consists of a MLV, Scraper Station facility and boost compressor for the Wasleys to Torrens Island 500mm NB loop-line, primarily supplying the Pelican Point Power Station.

Compressor capacity control is accomplished by varying engine speed, compressor cylinder loaders and the unit recycle valve position. A station fire and gas detection system is installed.

The compressor unit discharge flows through a skid mounted after-cooler assembly, to remove heat from the compressed gas. The discharge gas flow is metered using an orifice metering run. Unit fuel gas is metered using a coriolis meter.

A hydrocarbon waste collection tank is installed to collect hydrocarbons from the coalescer assemblies installed on the unit suction and discharge headers. A unit vent valve assembly is installed for the provision of purging and ESD facility. Ancillary equipment such as fuel/start gas and lube oil makeup systems are also installed.

Incorporated within the station compound is a services building that houses the control room, battery room and lunchroom facilities. A separate workshop and store facility is also provided.

**COMPRESSOR**

- The Wasleys compressor unit consists of a Caterpillar G3608TAW turbo-charged gas engine driving an Aerial JGC/4 reciprocating compressor. The station control system is PLC based and is accessed/controlled remotely via SCADA and locally via the Station HMI package. The control system provides station and unit control, including compressor start-up, shutdown and loading functions, as dictated by operational requirements.

METER/REGULATOR STATIONS

### 2.3.9. TORRENS ISLAND

| Torrens Island | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Daniel 2500 | |
| **Meter** | Orifice X 3 | |
| **Regulator #1** | Jetstream | 1825 kPa |
| **Regulator #2** | Jetstream | 1800 kPa |
| **Regulator #3** | Jetstream | 1775 kPa |
| **Regulator #4** | Jetstream | 1750 kPa |
| **Over Pressure Protection** | Slam Shut Valves X 3 | 2000 / 2030 / 2060 kPa |
| | Relief Valves X 2 | 1950 / 2100 kPa |
| **Telemetry** | Continuous | |

| Whyalla Co-Gen | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Fisher ROC 312 | |
| **Meter** | Turbine | |
| **Active Regulator #1** | Tartarini MFL 40 | 1880 kPa |
| **Monitor Regulator #1** | Tartarini MFL 40 | 2000 kPa |
| **Active Regulator #2** | Axial Flow Valve | 1880 kPa |
| **Monitor Regulator #2** | Axial Flow Valve | 2000 kPa |
| **Over Pressure Protection** | Slam Shut Valve | N/A |
| | Relief Valve | 2350 kPa |
| **Telemetry** | Continuous | |

| Pacific Salt | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | N/A | |
| **Meter** | N/A | |
| **Active Regulator** | Tartarini MFL 25 | 490 kPa |
| **Monitor Regulator #1** | Tartarini MFL 25 | 520 kPa |
| **By-Pass Regulator** | Fisher 627 | 500 kPa |
| **Over Pressure Protection** | Slam Shut Valve | N/A |
| | Relief Valve | 600 kPa |
| **Telemetry** | Continuous | |

| Pt. Bonython | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Daniel 2500 | |
| **Meter** | Turbine | |
| **Active Regulator #1** | Tartarini MFL 40 | 1080 kPa |
| **Monitor Regulator #1** | Tartarini MFL 40 | 1160 kPa |
| **Over Pressure Protection** | Slam Shut Valve | 1350 kPa |
| | Relief Valve | 1400 kPa |
| **Telemetry** | Continuous | |

| Pelican Point | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Fisher FloBoss 504 X 3 | |
| **Meter** | Turbine X 3 | |
| **Active Regulator #1** | T-Ball Valve / Bettis Actuator | 2700 kPa |
| **Monitor Regulator #1** | Mokveld Regulator | 2850 kPa |
| **Active Regulator #2** | T-Ball Valve / Bettis Actuator | 2700 kPa |
| **Monitor Regulator #2** | T-Ball Valve / Bettis Actuator | 2925 kPa |
| **Active Regulator #3** | T-Ball Valve / Bettis Actuator | 2700 kPa |
| **Monitor Regulator #3** | Mokveld Regulator | 3000 kPa |
| **Over Pressure Protection** | Isolation Valves X 3<br>Monitor Regulators x 3<br>(Fail Close) | 3700 kPa |
| | Relief Valve | N/A |
| **Telemetry** | Continuous | |

| Osborne Meter Station | | | |
|---|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** | |
| **Flow Computer** | Daniel 2500 | | |
| **Meter** | Turbine X 2 | | |
| **Regulator #1** | Becker Precision Equip. | 2400 kPa | |
| **Over Pressure Protection** | Over Press. Isolation Valve | Closes | Opens |
| | | 2760 kPa | 2670 kPa |
| | Relief Valve | N/A | |
| **Telemetry** | Continuous | | |
| **Osborne Off-Take** | | | |
| **Equipment List** | **Type** | **Set Point / Rating** | |
| **Flow Computer** | N/A | | |
| **Meter** | N/A | | |
| **Active Regulator #1** | Becker Precision Equip. | 2700 kPa | |
| **Monitor Regulator #1** | Becker Precision Equip. | 2900 kPa | |
| **Bypass Regulator** | Becker Precision Equip. | 2600 kPa | |
| **Over Pressure Protection** | Isolation Valve | Closes >3200 kPa | |
| | Relief Valve | N/A | |
| **Telemetry** | Continuous | | |

| Dry Creek | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Daniel 2500 | |
| **Meter** | Orifice X 2 | |
| **Regulator #1** | Jetstream | 1500 kPa |
| **Regulator #2** | Jetstream | 1450 kPa |
| **Over Pressure Protection** | Slam Shut Valve | N/A |
| | Relief Valve X 2 | 1625 / 1675 kPa |
| **Telemetry** | Continuous | |

| Gepps Cross | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Daniel 2500 | |

| | | |
|---|---|---|
| **Meter** | Orifice X 3 | |
| **Regulator #1** | Jetstream | 1750 kPa |
| **Regulator #2** | Jetstream | 1725 kPa |
| **Over Pressure Protection** | Slam Shut Valve | N/A |
| | Relief Valve X 2 | 1875 / 1925 kPa |
| **Telemetry** | Continuous | |

| **Taperoo** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Daniel 2500 | |
| **Meter** | Orifice X 2 | |
| **Regulator #1** | Fisher 399A | 1750 kPa |
| **Regulator #2** | Fisher 399A | 1725 kPa |
| **Over Pressure Protection** | Slam Shut Valve | 1900 kPa |
| | Relief Valve X 2 | 1875 / 1925 kPa |
| **Telemetry** | Continuous | |

| **Elizabeth** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Daniel 2500 | |
| **Meter** | Orifice X 3 | |
| **Regulator #1** | Fisher 399A | 1750 kPa |
| **Regulator #2** | Fisher 399A | 1725 kPa |
| **Regulator #3** | Fisher 399A | 1700 kPa |
| **Over Pressure Protection** | Slam Shut Valve | 1900 kPa |
| | Relief Valve X 2 | 1875 / 1925 kPa |
| **Telemetry** | Continuous | |

| **Wasleys Meter / Regulator Station** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Daniel 2500 | |
| **Meter** | Orifice X 2 | |

| | | |
|---|---|---|
| **Active Regulator #1** | Fisher 7610 | 6000 kPa |
| **Monitor Regulator #1** | Fisher 7610 | 6100 kPa |
| **Over Pressure Protection** | Isolation Valve | N/A |
| | Relief Valve | N/A |
| **Telemetry** | Continuous | |

| **Angaston** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Daniel 2500 | |
| **Meter** | Orifice X 2<br>Diaphragm x 1 | |
| **Regulator #1** | Jetstream | 700 kPa |
| **Regulator #2** | Fisher 399A | 650 kPa |
| **Township Regulator #1** | Fisher 298T | 350 kPa |
| **Township Regulator #2** | Fisher “Big Joe” | 330 kPa |
| **Over Pressure Protection** | Slam Shut Valve | N/A |
| | Relief Valve X 3 | 850 / 900 / 950 kPa |
| | Township Relief x 1 | 400 kPa |
| **Telemetry** | Continuous | |

| **Pt Pirie** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Daniel 2500 | |
| **Meter** | Turbine | |
| **Regulator #1** | Jetstream | 700 kPa |
| **Regulator #2** | Fisher 399A | 650 kPa |
| **Over Pressure Protection** | Slam Shut Valve | 900 kPa |
| | Relief Valve X 1 | 850 kPa |
| **Telemetry** | Continuous | |

| **Nurioopta** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Fisher ROC 312 | |
| **Meter** | Turbine | |

| | | |
|---|---|---|
| **Regulator #1** | Jetstream | 1050 kPa |
| **Over Pressure Protection** | Slam Shut Valve | N/A |
| | Relief Valve X 1 | 1200 kPa |
| **Telemetry** | Continuous | |

| **Symes Road** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Inline 832 | |
| **Meter** | Positive Displacement | |
| **Active Regulator #1** | Fisher 627 | 300 kPa |
| **Monitor Regulator #1** | Fisher 627 | 350 kPa |
| **Over Pressure Protection** | Isolation Valve | 390 kPa |
| | Relief Valve X 1 | 400 kPa |
| **Telemetry** | Continuous | |

| **Virginia** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Fisher ROC 312 | |
| **Meter** | Diaphragm | |
| **Active Regulator #1** | Fisher 310-32 | 300 kPa |
| **Monitor Regulator #1** | Fisher 310-32 | 350 kPa |
| **Over Pressure Protection** | Slam Shut Valve | N/A |
| | Relief Valve X 1 | 400 kPa |
| **Telemetry** | Dial up | |

| **Laukes Flour Mill** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | N/A | |
| **Meter** | N/A | |

| | | |
|---|---|---|
| **Active Regulator #1** | Fisher 627 M | 340 kPa |
| **Monitor Regulator #1** | Fisher 627 M | 360 kPa |
| **Over Pressure Protection** | Slam Shut Valve | N/A |
| | Relief Valve X 1 | 400 kPa |
| **Telemetry** | N/A | |

| **Metro Piggery** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | N/A | |
| **Meter** | Diaphragm | |
| **Active Regulator #1** | Fisher 627 M | 340 kPa |
| **Monitor Regulator #1** | Fisher 627 M | 360 kPa |
| **Over Pressure Protection** | Slam Shut Valve | N/A |
| | Relief Valve X 1 | 400 kPa |
| **Telemetry** | N/A | |

| **Penfield Roses** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | N/A | |
| **Meter** | N/A | |
| **Active Regulator #1** | Fisher 627 M | 300 kPa |
| **Monitor Regulator #1** | Fisher 627 M | 350 kPa |
| **Over Pressure Protection** | Isolation Valve | 400 kPa |
| | Relief Valve X 1 | 420 kPa |
| **Telemetry** | N/A | |

| **Freeling** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Fisher ROC 312 | |
| **Meter** | Diaphragm | |

| | | |
|---|---|---|
| **Active Regulator #1** | Fisher 627M | 300 kPa |
| **Monitor Regulator #1** | Fisher 627M | 350 kPa |
| **Over Pressure Protection** | Slam Shut Valve | N/A |
| | Relief Valve X 3 | 400 kPa |
| **Telemetry** | Continuous | |

| **Mintaro** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Daniel 2500 | |
| **Meter** | Orifice X 2 | |
| **Regulator #1** | Fisher 657 Control Valve | 1900 kPa |
| **Regulator #2** | Fisher 657 Control Valve | 1850 kPa |
| **Over Pressure Protection** | Slam Shut Valve | N/A |
| | Relief Valve X 2 | 2090 / 2090 kPa |
| **Telemetry** | Continuous | |

| **Peterborough** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Fisher ROC 312 | |
| **Meter** | Positive Displacement | |
| **Regulator #1** | Fisher Control Valve | 700 kPa |
| **Regulator #2** | Rockwell | 350 kPa |
| **Over Pressure Protection** | Slam Shut Valve | N/A |
| | Relief Valve X 2 | 800 / 450 kPa |
| **Telemetry** | Continuous | |

| **Burra** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Fisher ROC 312 | |
| **Meter** | Positive Displacement | |

| | | |
|---|---|---|
| **Regulator #1** | Fisher Control Valve | 700 kPa |
| **Regulator #2** | Fisher Regulator | 250 kPa |
| **Over Pressure Protection** | Slam Shut Valve | N/A |
| | Relief Valve X 2 | 850 / 300 kPa |
| **Telemetry** | Continuous | |

| **Bungama** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Fisher ROC 312 | |
| **Meter** | N/A | |
| **Active Regulator #1** | Jetstream | 4500 kPa |
| **Monitor Regulator #1** | Jetstream | 5000 kPa |
| **Over Pressure Protection** | Slam Shut Valve | N/A |
| | Relief Valve | N/A |
| **Telemetry** | Continuous | |

| **Whyalla Sales** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Daniel 2500 | |
| **Meter** | N/A | |
| **Active Regulator #1** | Tartarini MFL 25 | 640 kPa |
| **Monitor Regulator #1** | Tartarini MFL 25 | 680 kPa |
| **Over Pressure Protection** | Isolation Valve | N/A |
| | Relief Valve | 850 kPa |
| **Telemetry** | Continuous | |

| **Whyalla Supply** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Daniel 2500 | |

| | | |
|---|---|---|
| **Meter** | Diaphragm | |
| **Active Regulator #1** | Tartarini MFL 40 BP | 150 kPa |
| **Monitor Regulator #1** | Tartarini MFL 40 BP | 175 kPa |
| **Over Pressure Protection** | Isolation Valve | N/A |
| | Relief Valve | 200 kPa |
| **Telemetry** | Continuous | |

| **Whyalla BHP** | | |
|---|---|---|
| **Equipment List** | **Type** | **Set Point / Rating** |
| **Flow Computer** | Daniel 2500 | |
| **Meter** | Turbine | |
| **Active Regulator #1** | Tartarini MFL 80 | 700 kPa |
| **Monitor Regulator #1** | Tartarini MFL 80 | 750 kPa |
| **Active Regulator #2** | Tartarini MFL 80 | 690 kPa |
| **Monitor Regulator #2** | Tartarini MFL 80 | 760 kPa |
| **Over Pressure Protection** | Isolation Valve | N/A |
| | Relief Valves X 2 | 850 / 900 kPa |
| **Telemetry** | Continuous | |

## 2.4. MAIN LINE VALVES

There are 30 Main Line valves on the MAP installed approximately 32 km apart. Of these, 14 are actuated valves and are capable of remote operation. There are a further 15 non-actuated valves equipped with manual operators.

### 2.5.1 ACTUATED VALVES

There are 14 of these valves between Moomba and Torrens Island. These valves are equipped with pneumatic–hydraulic rotary vane type Shafer operators. These actuators are powered by natural gas extracted from the Mainline and regulated to a pressure suitable for this purpose. All of these valves have the facility to be remotely operated from Epic Energy's TSCC.

All valves are 550mm Cameron Full Bore Ball Valves and are installed below ground, with the exception of MLV4, located at Compressor Station #1 which is a 400mm Grove Full Bore Ball Valve. Incorporated into the MLV pipework is a 150mm NB by-pass line equipped with two 150mm NB Ball Valves.

### 2.5.2 NON ACTUATED VALVES

All valves are 550mm Cameron Full Bore Ball Valves and are installed below ground, with the exception of MLV4, located at Compressor Station #1, which is a 400mm Grove Full Bore Ball Valve. These valves are equipped with an operator and gearbox assembly to allow the valves to be operated manually. Incorporated into the MLV pipework is a 150mm NB by-pass line equipped with two 150mm NB Ball Valves.

## 2.5. ROW

For the Moomba to Adelaide Pipeline, access to compressor stations and pipeline south of Compressor Station 6, is by public roads. Access to pipeline north of Compressor Station 6 is generally via the Right of Way servicing the Moomba to Adelaide Gas Pipeline. A well formed gravel road within the pipeline easement corridor exists for the length of the pipeline from CS6 to the intersection of the Strzelecki Track, just north of CS2. North of this point to Moomba, the ROW contains an access track of variable condition.

Vehicle access between CS6 and CS5 is barred to through traffic by locked gates. Access between these points is only permitted to the affected Pastoral Lessees or authorised Epic contractors or employees that have work duties within this area. Through traffic has been banned as a measure to control the spread of a weed that is prevalent in this area.

Access to CS 5 is obtained by the Hawker–Yunta Mail Track, which intersects the Right of Way approximately 2km south of the Station.

The Strzelecki Track is used as access to facilities at CS1 and Moomba. A well formed gravel road, approximately 10km in length, maintained by Epic, connects CS1 to the Strzelecki Track.

For facilities such as communication towers and CP, access is generally via tracks across pastoral leases or private land. These tracks are generally covered by under-leases or easements, which allow access rights to maintain and repair facilities. Access tracks are gated and secured by lock and chain.

Maintenance of access roads has generally been confined to the repair of water erosion damage, following periods of unusually heavy rainfall.

## 2.6. SWER LINES

**TYPICAL SWER TRANSFORMER INSTALLATION**

### 2.6.1. MOOMBA TO COMPRESSOR STATION 1

Santos (at Moomba) operate a Three Phase, 11kV Power Line from their 'South Central' feeder ring main on the MAP.

Step Down Transformers are installed on the SWER Line to supply power for the Cathodic Protection TRU located on the Gas and Liquids Pipelines.

In 1997, the original SWER from Santos was extended to KP 62.0. This extension powers additional Cathodic Protection TRU sites on the pipeline and is owned and operated by Epic Energy.

### 2.6.2. COMPRESSOR STATION 1 - SOUTH TO KP 116.6

Epic Energy owns and operates a SWER from Compressor Station 1 to KP116.6. This SWER is powered by the GEAs at CS1 and is supplied from a 10 KVA, 415 V to 19 kV step-up transformer. This SWER line services NINE Cathodic Protection TRU sites and one Communications Site.

### 2.6.3. COMPRESSOR STATION 2 - SOUTH TO KP 290.1

In 1996, Hawker Council constructed the 19kv SWER line from CS2 South. This 47.7-km line is powered by the GEAs at CS2 and provides power for a Radio Communications Facility (KP 209), owned by Santos and operated by Epic Energy together with ELEVEN Cathodic Protection TRU units.

### 2.6.4. COMPRESSOR STATION 5 – NORTH TO KP 402.6

Epic's "CS5" SWER line draws power from ETSA's Yalpara SWER line. Operating at 19kV, it runs from that take-off point to KP 386.3 (near Erudina homestead), a distance of 138.2km. The SWER line powers three radio communications facilities and seventeen Cathodic protection installations.

## 2.7. PIPELINE MONITORING SYSTEMS

### 2.7.1. SCADA SYSTEM

Epic Energy operates and controls the Moomba to Adelaide Pipeline from the Transportation Services Control Centre (TSCC) in Perth, Western Australia, using the Epic Energy Metso SCADA System. The Moomba to Adelaide Pipeline can also be monitored and controlled from Epic Energy's emergency backup control centre in Dry Creek, South Australia.

The Epic Energy SCADA system is a distributed, dual redundant, SCADA system which utilises Epic Energy and third party communications providers to communicate to the remote field telemetry devices. A volume based Pipeline Leak Monitoring system is configured in the SCADA system to alarm when a defined volume imbalance is experienced in a defined period of time.

The SCADA system is well supported technically, by Epic Energy personnel in Perth, with Metso in Canada providing regular backup services.

### 2.7.2. COMMUNICATIONS AND SCADA

Communication links between the compressor stations, meter stations and MLV RTU's with TSCC consist of Epic Energy owned and leased infrastructure, as well as Santos owned infrastructure.

The Epic Energy owned infrastructure consists of Microwave Data Systems digital microwave bearer and RAD multiplexer. The infrastructure originates at Peterborough and terminates at compressor station 4. The bearer and it's associated multiplexer provide the backbone of the transmission path.

Epic Energy utilises the Santos infrastructure to communicate from compressor station 4, north to Moomba. This consists of an NEC microwave bearer and Nokia multiplexer. The infrastructure originates at Port Bonython and terminates at Moomba. The bearer and it's associated multiplexer provide the backbone of the transmission path.

The Epic Energy owned or leased infrastructure, provide the transmission path from Peterborough to Adelaide and then through to TSCC. The leased infrastructure consists of Telstra frame relay service. Epic Energy owns the Cisco routers, which provide the switching in Adelaide and Perth.

Epic Energy sites south of Peterborough utilise leased Telstra digital and analogue services. These services communicate directly back to Adelaide.

# 3. RISK ASSESSMENT SUMMARY

## 3.1. SUMMARY OF RISK ASSESSMENT ACTIVITY

An AS2885 Risk Assessment was undertaken for the MAP, which included all Laterals (Doc No: TEB-012-0007-01). The draft risk assessment report was submitted to PIRSA in December 2001 and the final revision provided in January 2002.

Following a review of the location and non-location specific threats to the pipeline, six categories were considered to be credible:

- Corrosion
- External Interference, including: excavation, trenching operations, hole boring, core sampling and bore drilling, blasting, dam building, road works, HDD operations, quarrying, construction activities, vibration at railway (cased) crossing, maintenance of drains and failure of other pipelines (rupture).
- Operations and Maintenance Threats, including: exceeding MAOP, pigging operations, incorrect operation of control equipment, bypass of logic and control equipment, inadequate maintenance procedures, inaccurate test equipment and inadequate servicing of pipeline.
- Natural Events, including lightning, floods/inundations, movement of sand dunes, erosion, and flotation of pipeline and impact by floating objects.
- Intentional damage.

Other threats, including: powerline breakages, induced voltages and fault current from parallel powerlines, anchorage, as well as cased crossings shielding the pipeline from adequate Cathodic Protection.

Of those credible threats, existing protection was determined to be adequate for the majority and they were consequently assessed as being at ALARP. The remaining threats were then assessed and risk ranked as follows:

- **Intermediate**:
- External corrosion (SCC) – All Laterals
- General corrosion (CP shielding) – Dry Creek, Taperoo, Burra, Peterborough, Port Bonython, Whyalla and Angaston Laterals
- Trenching operations – MAP, Burra, Peterborough, Whyalla and Angaston Laterals
- Power pole hole boring – MAP; All Laterals, except Osborne and Quarantine Laterals
- Dam building – Angaston Lateral

- **Low**:
- Internal corrosion ($CO_2$) – All Laterals
- General corrosion – All Laterals
- Bore drilling – Angaston Lateral
- Change of land use (Vineyard development) – Angaston Lateral

- Excavation of Telstra cable which crosses underneath MAP at KP680.7
- Fault current/Powerline breakage from parallel powerlines – MAP and Laterals
- Casing shielding pipe from adequate CP at railway crossings – MAP and Laterals
- Washout of Balcooracana Creek crossing KP351.3 – MAP
- Wilpeena Creek crossing KP386.5 – MAP
- Creek crossings at KP413.9 and KP547.4 – MAP
- Drain crossing at KP646.3 – MAP
- Failure of Origin 18inch pipeline at KP0.417 – Dry Creek Lateral
- Failure of Epic Energy 20inch Loopline at KP0.02 – Osborne Lateral
- Failure of Moomba to Port Bonython Liquids Line at KP68.1 – Port Pirie to Whyalla Lateral
- Failure of Moomba to Port Bonython Liquids Line at KP4.45 – Port Bonython Lateral
- Emergency anchor drop from passing ships at Port River – Taperoo Lateral
- Anchorage damage to both 4 inch steel pipeline and Lateral at Spencer Gulf crossing – Port Pirie to Whyalla Lateral

- **Negligible**:
- Mulligan Springs Creek crossing
- Failure of below ground Santos gathering pipeline where it crosses the MAP
- Failure of above ground Santos gathering pipeline where it crosses the MAP
- Fault currents/Powerline breakage

The risk assessment generated 9 global actions, 20 MAP location Specific actions, 7 Lateral location specific actions, 10 MAP non-location specific actions and 7 Lateral non-location specific actions.

## 3.2. SUMMARY OF HAZARD OPERABILITY ACTIVITY

A Hazard and Operability Study (HAZOP) program has been developed for 2002-2003. These HAZOPS cover all Moomba to Adelaide Pipeline above ground facility – ie Compressor Stations and Meter Stations.
HAZOP studies are detailed examinations, by a group of specialists, of components within a system to determine what would happen if that component were to operate outside its normal design mode. Each component has one or more parameters associated with its operation, such as pressure, flow rate or electrical power. The HAZOP studies undertaken on the MAP looked at each parameter in turn and used guide words to list the possible off-normal behaviour such as 'more', 'less', 'high', 'low' or 'no'.

In 2002, the following above ground facility HAZOPS were completed:

- All Meter Stations
- Compressor Stations 1,2,3, 5, 6 and Whyte Yarcowie.

It is anticipated that the remaining Compressor Station HAZOPS will be completed in early 2003. A report providing details of MAP HAZOPS will be forwarded to PIRSA on completion.

# 4. FITNESS FOR PURPOSE STATEMENT

The Moomba to Adelaide was constructed and commissioned in 1969. The pipeline has a Maximum Allowable Operating Pressure of 7.3Mpa and generally operates at or close to that pressure. The Pipeline was designed for the express purpose of transporting natural gas.

A "Risk Assessment" in accordance with AS2885, conducted in 2001/2002, confirmed that there are no threats to the asset, which are not being managed appropriately and that the asset poses an acceptable risk to public health, safety and the environment.

The Pipeline is being operated and maintained by Epic Energy, an experienced Australian pipeline owner and operator. Epic Energy has appropriate management systems in place to ensure the integrity of the Pipeline is maintained at all times.

Above ground coating surveys, coating inspections during excavations and analysis of data collected during pigging operations of the MAP, confirm that the internal and external condition of the pipeline is acceptable.

Noting the above, the Moomba to Adelaide Pipeline is assessed as being in good condition and fit for current and future purpose.

## 4.1. GROUNDS FOR FITNESS FOR PURPOSE

### 4.1.1. OVERVIEW OF GROUNDS FOR FITNESS FOR PURPOSE

The Fitness for Purpose statement in Section 4.0 is made on the basis of:

- 2001/2002 AS 2885 Pipeline Risk Assessment;
- 2002 Environmental Risk Assessment;
- Coating and pipeline inspections and assessments during excavations;
- Physical assessment of above ground facilities during routine maintenance activities;
- 2002 Intelligent pig results;
- Audits of Epic Energy's management systems;
- Lessons learned from Emergency Response Exercises; and
- A training review of people employed to operate and maintain the asset.

## 4.1.2. EPIC SAFETY POLICY

### Safety is our most important value

Epic Energy is committed to providing an accident free and healthy workplace for all employees, contractor and the public by implementing an integrated safety management system and maintaining the highest possible standards.

We believe that good OHS performance and practices are the responsibility of everyone at Epic Energy and are critical to the success of our business.

To achieve this, Epic Energy will:

- Ensure that systems are in place to protect the Health and Safety of all personnel on Epic Energy facilities as well as the environment surrounding it.
- Develop and maintain systems to promote employee involvement and communication in Health and Safety issues.
- Demonstrate effective management of Health and Safety through risk assessments and the development and implementation of safe operational procedures.
- Evaluate an manage changes to process, equipment, organisation and personnel to ensure that safety and environmental risks remain as low as practicable.
- Promote a health system which ensures that employees are not, as far as reasonable practicable, exposed to risks which may effect their health whilst at the workplace.
- Provide a system for the reporting and investigation of incidents and ensure follow up and remedial actions are implemented to prevent recurrence.
- Assess compliance with Health and Safety performance standards, good practice and legislative requirements and communicate this to all employee s and interested parties.
- Review the OHS policy periodically to ensure relevance, in line with our business.

**Sue Ortenstone**
**Chief Executive Officer**

## 4.1.3. EPIC ENVIRONMENTAL POLICY

### Epic Energy Operates in an Environmentally Friendly Manner

Epic Energy is Australia's largest gas transmission company, who construct, own and/or operate gas transmission pipelines throughout Australia. Epic is committed to minimising the impact of its activities on the environment in keeping with its belief that companies be increasingly responsible in their management of environmental issues.

To achieve this, Epic will:

- Ensure that it continues to research into and apply new technologies and procedures that reduce the impact of its activities on the environment.
- Comply with all relevant environmental legislation and the requirements of industry standards as a minimum requirement.
- Integrate care for the environment into the responsibilities and work ethics of all personnel.
- Minimise land and habitat disturbance by adopting best proactive environmentally sensitive means where no other requirements exists.
- Promote open communication with landholders and interested parties.
- Avoid disturbance to known or identified sites of cultural, historical, natural or scientific significance.
- Implement work practices to minimise erosion and sedimentation impacts on neighbouring properties and land.
- Develop opportunities for recycling and more efficiently using energy, water and other resources.

Environmental performance will be monitored regularly and the information communicated to all employees and interested parties/members of the community.

**Sue Ortenstone**
**Chief Executive Officer**

### 4.1.4. LANDOWNER LIAISON

There are 470 landowners and occupiers along the MAP system.

A property owner contact scheme is operated by Epic Energy. The Land Management Officer personally visits each owner or occupier along the pipeline system annually.

Other contacts made by Field Maintenance Officers and Superintendents during the course of daily business, or other land related issues that arise occasionally are recorded in our Land Management System.
Land Management is supported by dedicated LMS software that provides a powerful data base and MapInfo facilities. All property details and notes relating to discussions or issues with the property owners are recorded in the LMS. Through its MapInfo facility an image of the cadastral boundaries of each property relative to the pipeline route can be displayed for any property. During the year each property owner dwelling has been captured by GPS and will be displayed on the pipeline/cadastral plans.
If personal contact cannot be made, the occupier or owner is telephoned or mailed a letter explaining the reason for the visit, the contact officer's business card, an information brochure on pipeline safety and our dial before you dig contact phone number is left at all unattended residences visited. All property owners receive our pipeline safety brochure, a complimentary biro, as well as a high quality calendar, which is individually mailed out.

These items all contain our "**Dial Before You Dig**" contact phone number and strongly reinforce safe working practices near high-pressure gas lines.

A hard file is maintained for each of the 1500 land parcels crossed by pipelines. Each property is flagged with the Land Titles Office who inform Epic Energy of any changes in ownership or land tenure details, ensuring that our records are always up to date for mail outs and personal visits.

### 4.1.5. EMERGENCY RESPONSE POLICY

Epic Energy maintains an emergency response capability designed to ensure that Epic Energy:

- Minimises or eliminates any danger or risk to individuals,
- Minimises or eliminates any risk to the business, and
- Ensures that the pipeline system is returned efficiently to a safe, operational state with minimum customer and environmental impact.

Epic Energy will maintain a comprehensive team structure, equipment and services, all of which are tested regularly to ensure their preparedness and responsiveness to emergency events.

To enable this, the Emergency Response Manual and the mapped business process of *Responding to breakdowns and emergencies* shall be utilised.

The Emergency Response Plans will provide an Emergency Management Overview detailing the Epic Response Notification and the Emergency Management Team supplemented by the State response recovery plans.

Epic Energy's Emergency Response will follow a process based on Incident Command System that will work towards the establishment and maintenance of a uniform, fully integrated, well-coordinated response effort. Its aim will be to move the response from a reactive to a pro-active mode of operation as quickly and efficiently as possible. By addressing the needs of an emergency as a project, the techniques and benefits of project management will be utilised in achieving this aim.

Epic Energy reviews and tests its preparedness to respond to an emergency as follows:

- Two emergency response exercises are conducted in each state annually; and
- The first emergency response exercise on each pipeline system is performed as a desktop exercise.
- The second emergency response exercise on each pipeline involves considerable mobilisation and limited involvement of external parties.
- The third emergency response exercise on each pipeline system involves full mobilisation and maximum involvement of external parties.

Epic Energy has conducted two emergency response exercises on the Moomba to Adelaide Pipeline system in the last 5 years with the most recent being held on 3 October 2002.

### 4.1.6. MAINTENANCE PROGRAM

Epic Energy's Maintenance Program is designed to provide timely, quality and cost-effective service, along with technical guidance in support of operating plants. This drives action rather than reaction and ensures that assets are maintained to support the required level of reliability, availability, output capacity and quality. This is to be fulfilled within a working environment fostering safety, high morale and job fulfilment for all members, while protecting the environment.

The program outlines Epic Energy's maintenance organisation, detailing maintenance commitment, resource structure and work control philosophy.

The maintenance commitment outlines the maintenance to be performed on varying types of asset, detailing the frequency, duration, plant condition, type of maintenance action, rationale behind the activity to be undertaken and technical expertise required for the task.

The resource structure details the type of resource available and their responsibilities in the maintenance organisation.

The work control philosophy details the methodology on how the work is to be controlled.

#### 4.1.6.1. CHANGE CONTROL

The change control system describes the process by which all changes are proposed, approved and implemented.

It encompasses the initiation of a proposed change, the process by which the proposed change gains management approval, and the procedure by which the approved changes are monitored during the subsequent design

and implementation, as well as ensuring that the closeout details are collected.

The process is applicable to all Epic Energy personnel, contractors and consultants, where this change affects the Company's pipelines, equipment, control systems or designs and which may change the process characteristics or affect the operation, safety and integrity of such facilities.

### 4.1.7. MAXIMO

Maximo is the Computerised Maintenance Management System (CMMS) utilised by Epic Energy to implement the Maintenance Program. The CMMS is the work management tool for planning, scheduling, executing and controlling the maintenance work.

### 4.1.8. WORK INSTRUCTIONS

Work Instructions are a method statement of how routine maintenance or project work is to be progressed. All works on Epic Energy owned and operated sites, that may in any way constitute a safety hazard, or could impact on the integrity of the system, must have a Work Instruction developed for the work to be performed, prior to work commencing.

The intent of the Work Instruction is to enable a competently trained person to carry out a task, in a manner that does not compromise the individual's safety, the integrity of the equipment, or the integrity of the transmission process.

### 4.1.9. FIELD PERSONNEL

#### 4.1.9.1. TRAINING/COMPETENCY

Epic Energy is very committed to providing appropriate training for all employees. Field Maintenance employees undertake a range of training covering basic induction courses, job ready courses, corporate training and technical training. Refresher training is provided on a scheduled or as required basis (dictated by the course involved).

Epic Energy is in the process of implementing a Complete Human Resources Integrated System (CHRIS), which will include a detailed training database for all employees in the second stage of implementation. For the past five years, training records have been managed locally by Administration Coordinators and Maintenance Planning Officers. To further improve the current training management arrangements, a dedicated Training Coordinator has been appointed in regards to technical training. With the re-issue of AS2885.3 in 2001, Epic Energy is embracing competency-based training coordinated through this dedicated Training Coordinator.

#### 4.1.9.2. EXPERIENCE

Epic Energy Field Maintenance Officers perform maintenance on the Pipeline. Those Officers have cumulative skills covering all aspects of pipeline maintenance and emergency response. Many of those Officers have worked for Epic Energy or its predecessors since the Pipeline was constructed, with the average years of service on these pipelines, or within the industry, exceeding 15 years.

As a minimum, all new employees being recruited must either hold an electrical or mechanical trade certificate.

### 4.1.10. AUDITS

Epic Energy has developed and implemented a Safety Management System (SMS) for all operations and pipeline systems. An internal audit of the SMS was conducted in 2002 by third party auditors (ie: Department of Mineral and Petroleum Resources and IRC Consultant), in accordance with our Western Australia Safety Case requirements.

Annual audits of our Aviation Operators used for charter flights (employee transport) and surveillance flights, including fixed wing aircraft and helicopters have been completed in 2002. All aviation operators were deemed to be safe by the third party auditor – Hart Aviation.

Site housekeeping inspections are conducted monthly at all facilities in accordance with our SMS requirements.

## 4.2. PHYSICAL ASSESSMENT OF FACILITIES

### 4.2.1. PIPELINE

As part of the pipeline integrity program, sections of the pipework such as station suction and discharge pipes and pipework immediately downstream of aftercoolers in all compressor stations, except CS7, were excavated and inspected for SCC in 2002. The coating system on the majority of locations were found to be deteriorated, but no SCC or major pitting were detectable on the sections inspected and the pipes were found to be in good condition with no need for pipe reinforcements. In Moomba, the pipe immediately downstream of the insulating flange was excavated and inspected. Here too, the pipe coating was found to be beyond repair, but the pipe was in good condition with no SCC or pitting.

### 4.2.2. INTELLIGENT PIGGING SURVEY

A comprehensive intelligent (metal loss) pigging program was implemented for the MAP and the 20” Wasleys loop line in 2002. The loop line pigging is completed and a full inspection results report has been received. The intelligent tool did not identify any major defects on the loop line requiring excavation and repair.

The MAP pigging program is completed from Moomba to CS7 with the final section (CS7 to Torrens Island) still awaiting completion due to a minor obstruction.

So far the final results of the pigging program are not available but on-site assessment of the data has indicated excellent results recorded with good resolution. It is anticipated that final fully processed results will be available within 60 days of the completion of the program. An Addendum will be provided to this Report, when those results have been received and analysed.

### 4.2.3. METAL LOSS AND OTHER PIPE DEFECTS

Two defects identified in the preliminary reports between Moomba and CS1 were excavated, blasted and inspected to verify accuracy of intelligent pigging data and to fine tune the final processing philosophy. The size and depth of the two defects at KP 23.6404 and KP 45.615 have been found to be overestimated by the intelligent tool by 47 % and 55%. Money has been budgeted for 2003 and subsequent years to implement an inspection and assessment program covering the most severe defects.

### 4.2.4. SIZING PIGGING SURVEYS

#### 4.2.4.1. WELD DEFECTS

Major weld defects reported by the intelligent tool will be inspected in the Year 2003 defect verification program.

### 4.2.5. CORROSION CONTROL

To mitigate corrosion, all buried pipelines are covered with a protective coating which serves to isolate the external pipeline surfaces from corrosive elements in the surrounding environment.

Secondary protection at coating holidays and imperfections is achieved by applying cathodic protection.

#### 4.2.5.1. PERFORMANCE

The effectiveness of the cathodic protection system is monitored by carrying out two full line potential surveys annually, once at the end of summer and then again at the end of winter. This determines the level of protection and opportunity to retune the pipe to the required CP criteria of -0.850 V to -1.18 V OFF potential versus Copper/Copper Sulphate half cell.

In addition, all cathodic protection units (CPU's) are inspected for correct operation bi-monthly.

As a result of Year 2001 cathodic protection survey results, four new ground beds were installed in the following locations on the main gas pipeline:

- Kp 559.8 Peterborough site,
- Kp 638.0 CS7 site,
- Kp 691.0 Rhynie site,
- Kp 748.2 Gawler River site.

All except the one in Rhynie are of deep well ground bed. The Rhynie ground bed is a shallow vertical ground bed with 5 HSI anodes.

#### 4.2.5.2. INTERNAL CORROSION

As the gas received from SANTOS is free of moisture and corrosive species, the gas pipeline is not exposed to internal corrosion. This has been confirmed by checking data from several intelligent pig runs on the pipeline.

#### 4.2.5.3. COATING CONDITION

The condition of the coating on a pipeline can be determined qualitatively from the protective current density of the pipe and quantitatively by applying techniques like Close Order Potential Surveys (COPS) and Direct Current Voltage Gradient Surveys, (DCVG). The latter technique is more widely used as it is more efficient and can provide reliable results in a shorter period of time.

There were no DCVG surveys on the MAP during the reporting period; however, a series of such surveys are planned in 2003 and 2004.

#### 4.2.5.4. CURRENT DENSITY

The current density on the MAP changes from area to area depending on the soil moisture and corrosive salts content. As the pipeline has been in service more than thirty years and the original tape coating has deteriorated, that has increased the protective current demand of the pipeline. An average 100 mA/m2 in area with high moisture and salt contents, with deteriorated coating is expected, particularly in wet seasons.

#### 4.2.5.5. REVIEW OF THE CATHODIC PROTECTION RESULTS

Cathodic protection OFF potential profiles in February and July 2002 are given in Appendix 7.1. The profiles taken in dry and wet seasons indicate that during dry season the pipe potentials fall in some areas below the minimum of -850mV (Cu/CuSO4). This is mainly due to increased soil resistivity and reduction in the current pick up by the pipe. The situation improves during wet season as the soil resistivity decreases and pipe gets the required protective current to polarise. OFF potentillas in both surveys show low values around KP700. The ground bed in this area was renewed in December 2002 and it is expected that the pipe potentials will improve in the next survey.

## 4.2.6. PIPELINE EXCAVATIONS

### 4.2.6.1. ANGASTON LATERAL

Five locations on the Angaston Lateral were excavated in October 2002 according to the results of a DCVG survey conducted in April 2002.

The locations were as follows:

- Kp 36.880 with 31% IR drop
- Kp 32.705 with 49% IR drop
- Kp 31.655 with 50% IR drop
- Kp 28.996 with 43% IR drop
- Kp 21.215 with 39% IR drop

The coating in all cases was found to have deteriorated, but the pipeline did not show any pitting or SCC.

### 4.2.6.2. NURIOOPTA LATERAL

The pipeline at Kp 0.404 with an IR drop of 16% was excavated and inspected in October 2002. The pipeline coating was found to be laminated but the pipe metal was found in good condition with no signs of metal loss and SCC. The excavation was the follow up of a DCVG survey in April 2002 on the lateral. The defect was the most significant defect on the lateral.

### 4.2.6.3. MOOMBA TO ADELAIDE GAS PIPELINE

No excavations as results of DCVG surveys were conducted on the MAP in year 2002.

Two excavations were conducted to verify preliminary pig results, with favourable findings. Sections of non-piggable pipework were excavated at CS1-6, again with favourable results.

## 4.2.7. CONCLUSION ON PIPELINE CONDITION

### 4.2.7.1. PIPELINE COATING CONDITION

The original Plicoflex on the mainline is deteriorated and in some cases expose the pipe to shielding of the cathodic current. Due to status of the coating, the pipeline protective current shows an increasing trend, consistent with expectations.

### 4.2.7.2. CATHODIC PROTECTION SYSTEM

The pipeline cathodic protection system has reduced corrosion on the pipeline and has kept it free from SCC. New ground beds installed in the previous year and during 2002 have increased the protection levels along

the pipeline to within the requirements of the Australian Standard and Epic Energy's CP criteria.

#### 4.2.7.3. PIPELINE INTEGRITY

The status of the MAP was checked by running an intelligent PIG (Rosen) in 2002. The data on corrosion and other types of defects detected by the PIG will be verified through a systematic approach in Year 2003. The two excavations conducted between Moomba and CS1 indicated that the data reported by the PIG on pipeline metal loss were very conservative. The sections of the pipeline in these locations fulfilled the requirements of AS 2885- Part 3 1997 with no need for pipe reinforcements.

## 4.2.8. COMPRESSOR STATIONS

### 4.2.8.1. BUILDINGS AND ENCLOSURES

### 4.2.8.2. COMPRESSOR STATION SERVICES BUILDING

The buildings on the MAP compressor stations are purpose built and are of steel frame and aluminium cladding construction. The buildings are, generally, as follows:

- Services building

  This structure houses the control room, battery room workshop and store. All doors have entry alarms linked to SCADA to alert of any unauthorised intrusion. The doors are of steel construction.

  All areas within the services building are monitored for the presence of smoke and if smoke is detected, the fire detection system floods the area with an extinguishing agent (NAF S3).

- Generator Room

  This building is under the same roof as the services building and is connected to the services building by a breezeway. The station Gas Engine Alternators are housed within this structure along with their associated control gear and wiring.

  This building too, features a fire detection and suppression system.

- Unit Rooms

  These buildings house the Turbines and Process Compressors and have entry alarms fitted to all doors. They are furnished with a fire detection system.

- Oil Store

  This is an open fronted post and beam structure, purpose built to store oils, detergents, etc. necessary for the operation of a compressor station. It is fitted with a secondary system to ensure no oil can leak to the ground.

**B UNIT HIGH PRESSURE FUEL GAS SKID**

- Valve Skids

  There are several valve skids at these sites designed to protect valving etc from the elements during maintenance procedures.

#### 4.2.8.3. PLANT AND EQUIPMENT

Cooled recycle valves were installed into the pig trap kicker line pipework at Compressor Stations 1, 2, 4, and 6 to prevent the station shutting down on high discharge temperature. This project has increased station and unit reliability.

The Compressor Station unit valves were overhauled and the valve positioner replaced with Fisher DVC controllers, increasing fuel efficiencies and unit reliability.

Compressor station and compressor unit electrical services were completed in line with the maintenance program.

#### 4.2.8.4. SITE SECURITY

These facilities are protected against unauthorised entry by a 1.8 metre chain mesh topped with 3 strands of barbed wire with padlocked access gates in accordance with Epic Energy's common locking system.

All doors to the buildings within the compound are fitted with entry alarms linked to TSCC via SCADA to alert of unauthorised entry. These doors are likewise keyed to the Epic common locking system.

#### 4.2.8.5. ENVIRONMENTAL CONDITIONS

Approved maintenance plans and work procedures eliminate uncontrolled methane to atmosphere. Controlled venting during maintenance activities reduces gas emissions to a minimum.

Approved maintenance procedures and waste disposal practices eliminates any ground contamination from oil and hydrocarbons during filter inspections and changes.

Approved procedures and chemicals eliminate environmental hazards during pesticide and herbicide control activities.

## 4.2.9. MAIN LINE VALVES

#### 4.2.9.1. PLANT AND EQUIPMENT

All mainline valves with manual operators, Shafer operators and bypass valves are subjected to regular maintenance and maintained in a fully operational condition. All equipment is fully operational.

#### 4.2.9.2. SITE SECURITY

**TYPICAL REMOTE MLV COMPOUND**

These facilities are protected against unauthorised entry by a 1.8 metre chain mesh topped with 3 strands of barbed wire with padlocked access gates in accordance with Epic Energy's common locking system. The main Line Valve and By-Pass valves operators are chained and padlocked in the operational configuration also in accordance with Epic's common locking system.

Regular maintenance visits together with routine road and aerial patrols provide additional security checks to these facilities.

#### 4.2.9.3. ENVIRONMENTAL CONDITIONS

The environmental conditions at the MLV sites do not differ significantly from the conditions at the meter stations.

## 4.2.10. METER STATIONS

### 4.2.10.1. PLANT AND EQUIPMENT

All routine Meter Station custody transfer and Compressor Station fuel gas accuracy verification tests were completed as per the maintenance plan.

### 4.2.10.2. SITE SECURITY


**BEVERLEY METER STATION**

These facilities are protected against unauthorised entry by a 1.8 metre chain mesh topped with 3 strands of barbed wire with padlocked access gates in accordance with Epic Energy's common locking system. The main Line Valve and By-Pass valves operators are chained and padlocked in the operational configuration also in accordance with Epic's common locking system.

### 4.2.10.3. ENVIRONMENTAL CONDITIONS

Approved maintenance plans and work procedures eliminate uncontrolled methane to atmosphere. Controlled venting during maintenance activities reduces gas emissions to a minimum.

Approved maintenance procedures and waste disposal practices eliminates any ground contamination from oil and hydrocarbons during filter inspections and changes.

Approved procedures and chemicals eliminate environmental hazards during pesticide and herbicide control activities.

### 4.2.11. COMMUNICATIONS FACILITIES

#### 4.2.11.1. PLANT AND EQUIPMENT

There is a digital microwave system travelling the length of the pipeline, consisting of masts ranging through to 107m in height and equipment shelters, which contain battery systems and radio bearer equipment. Power to all sites is provided by either the compressor station power grid, or SWER line.

Mobile communications are maintained by a semi-cellular radio network that provides for communications with TSCC from anywhere along the pipeline. This consists of microwave site VHF base stations and Epic Energy vehicle mobile VHF radios.

#### 4.2.11.2. SITE SECURITY

All communications repeater station sites have entry alarms fitted to the outer and inner building doors. These are relayed to TSCC via the Spinifex system, which is monitored 24 hours a day. The external and internal doors are locked in accordance with Epic Energy's common locking system.

#### 4.2.11.3. ENVIRONMENTAL CONDITIONS

Approved maintenance plans and work procedures eliminate uncontrolled methane to atmosphere. Controlled venting during maintenance activities reduces gas emissions to a minimum.

Approved maintenance procedures and waste disposal practices eliminates any ground contamination from oil and hydrocarbons during filter inspections and changes.

Approved procedures and chemicals eliminate environmental hazards during pesticide and herbicide control activities.

## 4.3. MANAGEMENT SYSTEMS

### 4.3.1. SAFETY MANAGEMENT SYSTEMS

The Safety Management System developed for Epic Energy provides all Epic Energy personnel with a framework for the management of health and safety related risks on Epic Energy facilities.

The Safety Management System provides guidance to personnel at all levels of the organisation to ensure that all activities on site are undertaken safely.

The Safety Management System is an integral part of the overall management system at Epic Energy. It has been designed to complement other systems in order to facilitate the management of safety and risk at each facility.
The Safety Management System also provides a means for review of individual performance and a mechanism for continuous improvement of operational performance

Epic Energy management believes that all incidents are preventable and that the safety and health for all employees is the foremost business priority. As such Epic Energy has demonstrated its commitment to ensure compliance with good safety management practices by developing the Epic Energy Safety Management System in line with relevant standards and industry good practice guidelines.

#### 4.3.1.1. SAFETY MANAGEMENT SYSTEM MODEL

The Safety Management System model comprises of six (6) principles.

**Principle 1 Policy and Objectives**
Epic Energy has an Occupational Health and Safety policy, which defines health and safety objectives and commitment.
The Policy is endorsed by the Epic Energy Chief Executive Officer

**Principle 2 Planning**
Epic Energy has annual plans and schedules to ensure their Occupational Health and Safety Policy objectives are met.

**Principle 3 Implementation**
Implementation is achieved through the application of the fifteen (15) Health and Safety Standards.

**Principle 4 Performance Evaluation and Monitoring**
Systems are in place to monitor, assess and evaluate Health and Safety performance at Epic Energy.
Corrective actions are recorded, implemented and followed up to ensure non-compliances are rectified.

**Principle 5 Review and Audit**
Audits and review of the Safety Management System are scheduled on a yearly basis to ensure its effectiveness and identify opportunities for improvement.

**Principle 6 Continuous Improvement**
The process of continuous improvement is of the utmost importance in the management of health and safety. Epic Energy will strive to regularly review, monitor and audit their Safety Management System in order to identify opportunities for Health and Safety Performance Standard improvement.
The process of continuous improvement may also involve learning from other operators in the same industry.

#### 4.3.1.2. SAFETY MANAGEMENT SYSTEM STANDARDS

The Safety Management System Standards define the goals, deemed by Epic Energy, to be necessary to achieve a high level of Health and safety performance and reduce risk.

The Safety Management System structure comprises of fifteen (15) Health and Safety Standards. Objectives are defined for each Standard and a list of requirements address the scope of each element

The fifteen (15) Standards are as follows:

1. Policy and Objectives
2. Organisation and Responsibility
3. Risk Assessment and Risk Management
4. Employee Involvement
5. Employee Selection, Competency and Training
6. Contractors and Support Services
7. Design, Construction, and Commissioning
8. Safe Operational Procedures
9. Maintenance, Inspection, Testing and Modification
10. Management of Change
11. Health System
12. Emergency Response
13. Accident/Incident Investigation and Reporting
14. Performance Audit and Review
15. Other Documentation

### 4.3.2. ENVIRONMENTAL MANAGEMENT

Epic Energy is required to have in place an Environmental Management System for the operation and maintenance of the Moomba to Adelaide Pipeline.

Epic Energy currently operate the Moomba to Adelaide Pipeline in accordance with a Statement of Environmental Objectives [SEO] dated August 2000 and prepared in accordance with the requirements of Section 99 of the Petroleum Act 2000.

Epic Energy is currently developing a new Statement of Environmental Objectives for the Moomba to Adelaide Pipeline, which is expected to be gazetted in early 2003.

### 4.3.3. EMERGENCY RESPONSE

Epic Energy has changed considerably over the past five years. In a similar manner, the Emergency Response System has grown and changed to meet new requirements.

The system has been streamlined from three individual systems that were meeting the needs on a statewide basis to one national system that keeps hydrocarbons flowing to our customers. Epic Energy owns over 4100 km of pipeline in Australia, and operates another 951 km on behalf of other owners in South Australia, Queensland and Western Australian.
Epic Energy is prepared for a number of different emergencies. Epic Energy's greatest concern is the safety of employees and the public and loss of supply to customers. The focus of the emergency response is to ensure that this does not happen with resources placed in each state to provide a quick response to events that may interrupt supply, affect the integrity of our assets and the safety of employees and the public at large.

#### 4.3.3.1. EMERGENCY RESPONSE DRILLS

Pipeline Licence 1 requires emergency drills be held on the pipeline system at least every two years.

A full mobilisation exercise "Exercise Moomba" was the national crisis and emergency management exercise for Epic Energy. Exercise Moomba took place on 1st October 2002. The scenario involved serious complication to a routine repair at Wasleys.

**Objectives of the emergency exercise:**

- To test the ability of the South Australian Emergency Response Team and Emergency Management Team in response to a standard which meets regulatory requirements, including the mobilisation of personnel and equipment to the incident site.
- To test the response room set ups in Dry Creek and Perth.
- To test the callout system of the Epic Energy Crisis Management Team and the Head Office supporting teams and the South Australian technical and sales teams as appropriate to the scenario.

**Aspects handled well included:**

- Switchboard – SA and WA
- Government liaison – South Australia
- Information flow
- Human resources

**Priority improvements areas:**

- Timely information sharing
- Media Management
- Proactive and reactive stakeholder liaison

### 4.3.4. MAINTENANCE PROGRAM

The maintenance program for Epic Energy operated assets has been developed from "what we have always done". This basis is not in line with an effective and efficient maintenance program.

To improve maintenance practices, a "Bottom up" analysis will be performed, taking into consideration the failure characteristics, statutory and regulatory requirements of the items and the relative criticality of the equipment/system based on Safety, Environmental and Business risk.

The maintenance workflow process lacks detail and does not fit, or is not aligned to the CMMS. Detailed mapping is to be undertaken to align specific business processes, with positions in the organisation and the CMMS.

### 4.3.5. MAXIMO

The CMMS functionality has not been fully explored to return maximum benefit for the company. Identified areas of improvement include:

- The methodology in which the workload is grouped in the CMMS does not allow for interrogation of maintenance performed and improvement of that maintenance. A detailed "bottom up" analysis will allow the maintenance to be identified and structured differently to facilitate the improvement process, utilising the CMMS.

- The functionality of specific areas of the CMMS is not used to its fullest extent. This is in lieu of details written into other documents; specifically Lock out/tag out and Safety instructions; and
- The resource structure in the CMMS places constraints on the efficient utilisation of maintenance resources.

### 4.3.6. WORK INSTRUCTIONS

Work Instructions exist in various forms from Draft to Approved. These Instructions need to be brought up to a standard and stored within the central filing system within the business. Some Instructions were created before the implementation of the CMMS. These Instructions need to be revisited to determine if the functionality of the CMMS can meet the intent of the Instructions.

The Work Instruction documentation needs to be dissected and areas such as tag out/lock out and safety instructions must be reviewed to determine if the CMMS functionality can provide the required outputs and control.

### 4.3.7. FIELD PERSONNEL

#### 4.3.7.1. TRAINING

In 1999, Epic Energy undertook an Organisation Review that resulted in the centralisation of corporate functions into the Head Office in Perth. Included in that review was the level of Maintenance staff and their work patterns.

Epic Energy introduced a new philosophy surrounding performance management. This relied on the cascading of corporate objectives through the Strategic Plan, to the Corporate Business Plan, to Departmental Business Plans, to Workgroup Charters, to individual Tasks and Targets. An integral component of that process was the assessment of current skills and competencies within the workforce. From that skill assessment, Epic Energy was able to identify key training needs for individuals.

Considerable training was carried out in SA for field maintenance personnel, including:

- Base Line (Petroleum Industry) training was completed by all Epic Energy field personnel;
- Senior First Aid Training (re-certification) was completed by all field staff;
- Health, Safety and Environmental (HSE) Induction training was completed by all Epic Energy field personnel;
- Permit to Work training was completed by all Epic Energy field personnel;
- Remote Operations Controller (ROC) Training for Fisher ROC's was completed by all Epic Energy electrical and instrumentation staff;

- Water Bath Heater training to accommodate the maintenance to be carried out at the new Quarantine Power Station and Hallet Power Station was carried out by Tomlinson Boilers;
- Bristol Babcock Remote Terminal Unit training was conducted by Bristol;
- Dr Hassan Nabi-Zadeh (Epic Energy Corrosion Control Engineer) conducted in house Cathodic Protection training;
- Pipeline Location training in the use of Metrotech 9800 series Pipeline Locators was conducted by Corrpro Pty Ltd;
- Confined Space Entry and the use of Breathing Apparatus Course was conducted by BOC Gases Pty Ltd;
- Wasleys Compressor Package training was conducted by Collicutt Pty Ltd (Canada, supplier of Package); and
- Familiarisation training in the maintenance of Gorter and Pietro Fiorentini regulators was conducted by the suppliers.

#### 4.3.7.2. EXPERIENCE

Turnover within Epic Energy is monitored as a key performance indicator. While turnover is currently running at about 10% per year, this remains below the national average. Notwithstanding this, the national turnover among personnel directly associated with the operation and maintenance of the Moomba to Adelaide Pipeline is less than 5%.

### 4.3.8. AUDITS

Epic Energy has developed and implemented a Safety Management System (SMS) for all operations and pipeline systems. An internal audit of the SMS was conducted in 2001 followed by an emergency equipment review in 2002. This was supplemented by audits conducted by Det Norske Veritas (DNV) and El Paso.

Housekeeping inspections are conducted monthly at all facilities in accordance with our SMS requirements.

#### 4.3.8.1. OPERATIONAL AUDITS

Epic Energy is partially owned by El Paso Corporation, a major North American gas transmission company. The El Paso Corporate Audit Division conducted an operational audit on Epic Energy in the third quarter of 2001.

#### 4.3.8.2. ENVIRONMENTAL AUDITS

As the owner of the Moomba to Adelaide Pipeline, Epic Energy is required to have in place an Environmental Management System. A complete review of that EMS was carried out in 2001, following the development of SEO's for operating pipelines in SA. The Audit looked at the effectiveness and system structure relating to the SEO's. Modifications were carried out on the Aspects Register and included an update of the Obligations Register.

An internal audit was carried out during 2002 and all action items raised during this audit are due for completion by 31st March 2003. It is pleasing to report that most of the actions items raised have already been attended to.

PPK Environmental & Infrastructure Pty Ltd were commissioned to undertake environmental monitoring works at several sites along the Moomba to Adelaide Pipeline. These sites included Compressor Stations 1 - 7, the Mintaro Meter Station, Peterborough Depot and Torrens Island Meter Station. The objectives of the program are part of ongoing environmental monitoring and walk through inspections to identify significant environmental issues.

Groundwater monitoring was carried out at selected sites to determine the extent of hydrocarbon plume beneath the site and whether this has changed since the previous round of monitoring. The 2001 survey provided evidence of natural degradation of the plume. The program is to ensure that any significant breach in the integrity of the scrubber tanks on the above sites is identified, to enable a response strategy to be implemented if required. Monitoring of previously identified hydrocarbon contamination within the groundwater at the Torrens Island site was carried out to determine the migration of contaminant and assess the potential for natural attenuation. A general reduction in the hydrocarbon concentration since previous monitoring round has occurred with evidence of natural biodegradation of hydrocarbons. Groundwater monitoring at the Torrens Island Meter Station will continue to assess the migration of the petroleum hydrocarbon contamination within the groundwater and provide evidence of natural attenuation of the hydrocarbon plume beneath this site.

Due to presence of a localised area of phase separated hydrocarbon product in the vicinity of the former soakage pit at Compressor Station 7, a passive skimming groundwater remediation system was installed in 2001. The objective was to remove as much phase-separated hydrocarbon (PSH) product as practicable from the groundwater. This reduces the spread of the contamination plume within the groundwater. The passive skimming unit has been operating effectively and has reduced the thickness of phase-separated hydrocarbons to a thin film. It has been recommended that the unit remain in operation until the rate of PSH recovery becomes negligible.

Existing areas of “African Rue”, an exotic weed along the Right Of Way in the vicinity of CS5, were monitored and sprayed at appropriate intervals.

#### 4.3.8.3. SAFETY AUDITS

Epic Energy has developed and implemented a Safety Management System (SMS) for all operations and pipeline systems. An internal audit of the SMS was conducted in 2001. Further to this, Det Norske Veritas (DNV) undertook an external review in accordance with our Western Australia Safety Case requirements.

Housekeeping inspections are conducted monthly at all facilities in accordance with our SMS requirements.

### 4.3.9. CLASS LOCATION CHANGES

There has been no class change along the pipeline.

## 4.3.10. RIGHT OF WAY MAINTENANCE

Epic Energy ensures the pipeline safety through regular and frequent road and aerial patrols and pipeline warning signs.

### 4.3.10.1. WASH OUTS

Washouts occurred after heavy rains at Muligans Creek on two occasions, each time exposing the top of the pipeline for a short distance.

Heavy rains caused Moorowie Creek to flow just south of Compressor Station 6 and expose the top section of the pipeline.

The Balcoracana Creek immediately north of Compressor Station 4 flooded on several occasions and twice exposed the top of the pipeline for several metres.

### 4.3.10.2. SIGNAGE

Approximately 700 new “Pipeline Warning“ signs were installed on the Moomba to Adelaide Pipeline to increase line of sight and ensure full compliance with AS 2885.3. The sections between Moomba and Compressor Station 2, Compressor Stations 4 and 5, and Peterborough to Compressor Station 7 were all upgraded.

### 4.3.10.3. AERIAL SURVEILLANCE

All routine aerial patrols and above ground facility inspections were competed as scheduled.

### 4.3.10.4. ROAD PATROLS

All routine road patrols and above ground facility inspections were competed as scheduled.

### 4.3.10.5. PIPELINE LOCATION SERVICE

Epic Energy provides a free service to locate pipelines for which they are responsible. This service is primarily used by other companies carrying out civil works in the vicinity of any of the pipelines administered by Epic Energy.
There were 190 actual pipe locations carried out for third parties on the Moomba - Adelaide Pipeline in 2002. The majority of the pipeline locations requested were as a result of the “One Call“ system, they ranged from new installations crossing the pipeline, new fences as a result of subdivisions, and general activities on the pipeline easement. All authorised activities within the pipeline easement are supervised by Epic Energy field officers to ensure the safety and integrity of the pipeline.

### 4.3.10.6. LANDHOLDER CONTACT PROGRAM

Every twelve months, all property owners and local bodies such as councils and emergency services, along the pipeline are visited as part of a contact scheme. The scheme is intended to remind and keep property owners/occupants aware of the potential hazards of high pressure gas pipelines. During each visit the property owner/occupant is informed of the rules and the obligations associated

with the pipeline easement through their property and the requirement to notify Epic should they plan any excavation within the easement.

## 4.4. OTHER RELEVANT INFORMATION

### 4.4.1. PIPELINE THROUGHPUT

Pipeline Sales Volumes during the five years amounted to 1.28E10 standard cubic metres.

### 4.4.2. SECURITY OF SUPPLY

Epic Energy operates a 24 hour/365 day a year Control Centre in Perth, monitoring all of its pipelines including the Moomba to Adelaide Natural Gas Pipeline, using Valmet on the Metso SCADA system.

All aspects of operation are monitored from the Control Centre including field travel movements and maintenance work on operational equipment. Outages on rotating equipment are planned during spring and autumn to ensure availability of critical equipment during the high demand periods of summer and winter.

The use of the Customer reporting System enables Epic to schedule gas flows on the pipeline to maintain system security and reliability and ensure that the capability of the system is not over extended. Liaison with Santos at Moomba as well as the principal Shippers on the pipeline enables Epic to ensure that sufficient receipts are obtained to meet Customers expectations. This particularly applies to maintaining adequate delivery pressures at the Adelaide end of the pipeline by controlling linepack.

### 4.4.3. OTHER REPORTING REQUIREMENTS

Through the period covered by this report, other reports provided to Origin Energy by Epic Energy related to:

- Annual Pipeline Licence Reports;
- Emergency Response Exercise Reports;
- Monthly Operational Reports and
- Incident Investigation Reports.

### 4.4.4. OTHER RELEVANT INFORMATION

***MAP Technical Audit Projects***

During 2001, an internal audit of the MAP facilities was carried out by Epic Energy personnel, to assess the reliability and suitability of equipment and systems on MAP facilities. This was to identify areas that did not meet Epic Energy's standards. The audit identified some key areas where work was required to bring the facilities up to a "Fit for Purpose" standard and a number of Stay in Business (SIB) Projects were planned to scope and execute the required improvements to the system. The plan was to implement these projects over a 3 year period with initial emphasis being placed on the more critical areas.

The projects were divided into the key area as described below:

MAP 1 – Project Management

The purpose of this project was to Project Manage all of the Technical Audit projects. It was acknowledged, when identifying the projects, that the magnitude of the projects would require a dedicated project manager in SA, to be responsible for the scope, design and implementation of all of the projects. This project is one through a 3 year plan.

MAP 2 – Essential As-built Drawings

The technical audit identified that many drawings of the MAP facilities were either non-existent or lacking up-to-date information. The areas of main concerns were the lack of as-built information on the facilities P&ID's, the lack of any hazardous area drawings of the facilities and the lack of any SLD's for the MAP system. It was also identified, that due to the lack of hazardous area drawings, little could be confirmed about the Intrinsic Safety status of much of the instrumentation on the MAP. Hazardous Area verification dossiers were also required to be produced, so as to identify where non-compliant equipment was present and where the installation of this equipment needed to be addressed.

During 2002, the following documentation was completed to the stage of Issued for Client Review:

- Compressor Station P&ID's.
- Meter Station P&ID's.
- Compressor Station Hazardous Area Drawings.
- Meter Station Hazardous Area Drawings.
- SLD's for the entire MAP system.
- Hazardous Area Dossiers.

This documentation will be finalised in the early stages of 2003.

The Hazardous Area dossiers were accompanied by a report detailing the areas of non-compliance of instrumentation on MAP facilities. It is anticipated that both the Hazardous Area dossiers and also the non-compliance report, will be completed in the early stage of 2003. Following that, an implementation program will commence to implement the recommendations made by the non-compliance report, in order to ensure full compliance with hazardous area standards across all MAP facilities. It is expected that the process of implantation will take place over a two year period, finishing at the end of 2004.

MAP 3 – Earthing and Lightning Protection

The technical Audit identified that many of the facilities on the MAP had insufficient grounding of both static, above ground facilities and also of electrical systems. During 2002, an audit of the earthing and Compressor Station and Meter Station facilities was conducted. A rectification program was put in place and the initial

phase of work, involving extending the ground beds and bonding all above ground equipment to the ground bed was implemented on 4 sites during the latter half of 2002. A program is in place to complete the static earthing early in 2003 and progress to the electric systems. This program will be complete by end 2004.

MAP 4 – Buried Pipework Integrity

The audit identified the requirement to survey buried pipework in the facilities to ascertain its Corrosion Protection (CP) status. A series of dig-ups of the compressor station facility pipework were performed throughout 2002 and the CP status checked. No signs of SCC were found at any facility and rectification work was performed where the CP or pipeline coating was found to be inadequate. This project is essentially complete apart from CS7, which will be addressed early in 2003.

MAP 6 – Replace Antiquated Equipment

Much of the instrumentation on the MAP facilities in becoming unreliable, due to increasing age. A large proportion of this equipment is no longer supported by the original vendor. This technical Audit identified that this instrumentation needed to be replaced with more modern equipment in order to ensure reliable service.

In 2002, the MAP Meter Stations were audited and a report was produced detailing the equipment that required replacement at each MS. A program was then implemented to replace this equipment over the period 2002-2003. The more critical stations were targeted for 2002 and these were completed in the 4$^{th}$ quarter of 2002. The remaining Meter Stations will be completed early in 2003, followed by an audit of antiquated equipment at Compressor Stations. This will be followed by a replacement program at the Compressor Station during 2004.

MAP 7 – Upgrade Drainage and Sewerage

This project scope was identified during HAZOP of the MAP facilities. The main areas of concern are containment underneath the scrubber vessels and drain facilities from compressor enclosures. This project will be fully scoped and implemented during 2003.

MAP 9 – Buffer and Pulse Air Upgrade

The current supply of Buffer and Pulse air for the Solar Taurus compressor packages is very unreliable and also has no back-up supply. The technical audit identified that in order to increase availability of these machines, an alternative air supply was required along with a back up supply in case of failure.

The design for the alternative air supply was finalised in late 2002 and is ready for implementation. It is anticipated that this modification will be completed once suitable outages can be obtained on the MAP, probably by April/May 2003.

MAP 10 – Fuel Gas Relocation

The fuel gas supply for the Solar Taurus 1, 3, 5 and 6. Fuel gas is being supplied at less than that recommended by the supplier and is in the region that could possibly cause damage to compressor blades etc. The areas of main concern were the 'A' units which are the primary unit at each site and in particular sites 1, 3, 5 and 6.

A simple fix was identified to bring an immediate increase to the fuel gas temperature and that was to re-locate the fuel gas take-off point to upstream of the station after coolers, thereby making use of the hot gas immediately downstream of the compressor discharge. This design was finalised and fully implemented for the 'A' unit at each of the station mentioned above in the second half of 2002.

MAP 11 – Replace Rusted MS Fittings

Many fitting at MAP facilities are mild steel and as such have suffered severe corrosion over the years. An audit of the all the Meter Station sites was conducted in early 2002 to identify the extent of the problem. Once the extent of the problem had been determined, stainless steel fitting were purchased to replace the mild steel ones. A program was implemented in the second half of 2002 to replace the fitting identified.

2003 will see a similar audit conducted of Compressor Station facilities to identify where corroded fitting may also be an issue here. Once identified, a replacement program will be implemented to be completed by end 2003.

MAP 12 – Regulator Temperature Upgrade

The audit identified areas where pressure regulators are regularly freezing over. Concerns were raised about the reliability of the regulator and also the suitability of some of the components both upstream and downstream of the regulator to the low temperatures.
A study was completed in 2002 to assess the systems where freezing is known to occur and recommendations from this study will be implemented in 2003.

### 4.4.5. FUTURE OPERATIONS

The MAP is expected to operate at high demand levels through 2003. From 2004, it is expected that the volume of gas transported will reduce with the commissioning of the SEAGas pipeline. This will have a disproportionately large reduction in the number of operating hours for the MAP compressor units. From 2006, there is a possibility that the pipeline capacity will not be fully contracted and in that situation Epic Energy would consider 'moth-balling' options for some of its compression equipment.

The reduction in average day load will not reduce the workload associated with communications and metering. Moreover, the utilisation of lateral compressors and delivery points is expected to remain high.

# 4.5. ADVERSE FACTORS

## 4.5.1. REPORT ON HAZARDS TO THE PIPELINES

Several Audits, both Safety and Technical and HAZOPS have been conducted on the Moomba to Adelaide Pipeline over the past 3 years. These include:

- An operational review of the Australian Operating Facilities of EPIC Energy was performed in October and November of 2001 by members of Epic Energy parent company, El Paso.

  This audit required 33 items to be actioned, with all of these actions being now at a completed and closed out status. During this audit, Epic Energy were commended for 19 operational/procedural initiatives.

- In 2001, an extensive Technical Audit was undertaken of the facilities along the length of the Pipeline. This resulted in 12 major 'Stay in Business Projects' being identified and funds approved for commencement. These range from Essential As-Builts, Earthing and Lightning Protection to Upgrade Control Philosophy. These projects are ongoing through 2003.

- Most MAP Compressor Stations were subjected to a rigorous HAZOP Study throughout the course of 2002. Management, Engineering and Maintenance Staff attended these HAZOPS, with delegates from PIRSA invited to the initial study, conducted in Dry Creek. The remaining HAZOPS were carried out on site and many perceived "hazards" were analysed and discussed and, if not considered ALARP (As Low As Reasonably Practicable), were recorded for further action. The Stations that were not included in the Hazop surveys in 2002, will be picked up in the first quarter of 2003.

- An Intelligent Pigging program was carried out in the last quarter of 2002 with the findings yet to be tabled. It is envisaged that an extensive rehabilitation operation will be undertaken to address any problem areas highlighted by the report.

These studies indicated the risks to the pipeline were, in general at an acceptable level. Extensive programs are underway to rectify and enhance the pipeline systems, highlighted by the Technical Audit, to ensure the continued safe, reliable operation of the asset. This, together with the ongoing HAZOP studies and the work which will flow on as a result of these studies, ensure that Epic Energy will continue to meet their obligations, as a responsible pipeline operator, with the highest regard for safe, reliable operation.

In addition to these initiatives, there are ongoing programs of Right of Way Line of Sight clearing, comprehensive Landowner contact and an increase in the number of Pipeline markers. These, coupled with an efficient "Dial before you Dig" system and an extensive aerial and road patrol strategy, ensures that the threat of third party encroachments on the pipeline easement, is mitigated.

## 4.5.2. 3RD PARTY INCURSIONS

Third party activity is identified as the greatest risk cause for damage to the Moomba to Adelaide Pipeline and its laterals. Unauthorised activity on the pipeline easement is the greatest concern.

The risks identified are from landowners erecting fences or establishing new vineyards and changing the land use, utilities and councils installing new services and unauthorised use of heavy machinery and earth moving equipment on the easement.

Third party activity has is identified as the greatest risk to cause damage to the Moomba to Adelaide Pipeline. Unauthorised activity on the pipeline easement is the greatest concern.

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### 4.5.3. COMMUNITY AWARENESS


Epic Energy implements a Community Awareness Program, which entails holding awareness meetings with communities along the pipeline route.

The target is to hold meetings approximately annually with CFS, MFS, police, ambulance, SES, councils, Earth Moving Contractors, irrigation installation contractors and various community members invited to attend.

## 4.6. FITNESS FOR PURPOSE SUMMARY

Based on the physical assessment of the Moomba to Adelaide Pipeline, a review of the management systems governing the manner in which the Pipeline is operated and maintained and any other relevant information, the Moomba to Adelaide Pipeline is assessed as being in good condition and fit for current and future purpose.

# 5. CONCLUSIONS

This Fitness for Purpose Report has been compiled in accordance with the requirements of the South Australian Petroleum Regulations 2000, Division 4, Regulation 30. It has concluded that the Moomba to Adelaide Pipeline (covered under Pipeline Licence 1) is fit for purpose.

An assessment of the above ground facilities has identified them to be generally in good condition. A formal hazard and operability study [HAZOP] of all above ground facilities, has been undertaken and will be completed in the first quarter of 2003.

The below ground pipework has been subjected to inspection by Intelligent Pigging, and the findings of this inspection will be acted upon as required. The pipeline cathodic protection system has reduced corrosion on the pipeline and has kept it free from SCC. New ground beds are installed as required in an ongoing program. The cathodic impressed current levels will be kept at the optimum level, which will ensure continued protection to the pipeline.

The management systems employed by Epic Energy, in the operation and maintenance of the Moomba to Adelaide System, are robust and regularly audited. Incorporation of the Environmental Impact Review and Statement of Environmental Objectives has further reinforced the integrity of managing environmental issues on the Pipeline.

Epic Energy has a structured process in place for recruitment and training of employees, which ensures personnel involved in the operation and maintenance of the Moomba to Adelaide Pipeline are competent and have appropriate levels of experience. Improvements to the management of training will be ongoing and will be aided by the introduction of a new Complete Human Resources Integrated System.

Several Emergency Response Exercises have been conducted, one of which required full field mobilisation of all resources, in the simulation of an actual emergency response and repair procedure to a pipeline emergency. The investigation on our performance during the exercise, found that it had been handled in an expedient and safe manner.

During 2003, Epic Energy evaluated compliance to AS2885 and identified a number of shortfalls requiring attention. An action plan was immediately put in place to remedy the identified short falls. An external audit, commissioned by PIRSA and carried out by an independent contract auditor, identified similar areas requiring attention to achieve full compliance with AS2885.

Effectiveness of Third party liaison programs were found to fall short in some areas. This issue was immediately addressed, presentation approach, material and delivery were amended to provide better effectiveness. Databases identifying landowners, emergency services, contractors and interested parties were updated. A base line awareness program is now under way. This activity will be completed by December 2003.

A dedicated pipeline Safety and Operating Plan is not in place for the Moomba to Adelaide Pipeline, however Epic Energy can fulfill the requirements of the SAOP from other systems. A dedicated SAOP is currently being developed for the Moomba to Adelaide Pipeline and will be completed by November 2003.

The need for a Fracture Control plan and dedicated Integrity plans for un-piggable laterals and pipework covered by PL1, was identified as AS2885 compliance requirement. These plans are being developed and will be completed for PL1 by November 2003.

It is concluded that the Moomba to Adelaide System is fit for purpose and will continue to be fit for purpose for the foreseeable future. As a minimum, the Pipeline is assessed as being fit for purpose for the next five years, whereupon a further Fitness for Purpose Report will be compiled. Should the operational circumstances surrounding this asset change within that five year period, this Fitness for Purpose Report will be reviewed to determine whether any operational adjustment is required.

# 6. RECOMMENDATIONS

Notwithstanding the Fitness for Purpose of the Moomba to Adelaide Pipeline system, the following recommendations have arisen from this Report:

- Completion of the HAZOPS on the above ground facilities be pursued early in 2003;
- Continue to embrace the regulatory approach adopted by PIRSA to ensure all PL1 commitments are met or exceeded; and
- Continue with the current Stay in Business Projects program to optimise pipeline operation and safety.

# 7. APPENDIX

## 7.1. APPENDIX 1: PIPELINE CATHODIC PROTECTION POTENTIAL PROFILES

## 7.2. APPENDIX 2: INTELLIGENT PIGGING RESULTS

To be provided in a separate report.

# APPENDIX 1: PIPELINE CATHODIC PROTECTION POTENTIAL PROFILES