



**epic***energy*

## **2004 ANNUAL REPORT**

**On**

**Pipeline Licence 3 & 4**

## **SOUTH EAST PIPELINE SYSTEM**

**Document Number S-31-107-AR-G-001**

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## LIST OF ABBREVIATIONS

AS2885	Australian Standard 2885 Pipelines - Gas and Liquid Petroleum
AVT	Accuracy Verification Test
CFS	Country Fire Service
CP	Cathodic Protection
CPU	Cathodic Protection Unit
DCGV	Direct Current Voltage Gradient
DNV	Det Norske Veritas
EMS	Environmental Management System
ESD	Emergency Shut Down
GPS	Geographical Positioning System
HELM	Heritage, Environment and Land Management
HSE	Health, Safety and Environment
LMS	Land Management System
MFS	Metropolitan Fire Service
MLV	Mainline Valve
PIRSA	Primary Industries and Resources of South Australia
PL3&4	Pipeline Licences 3 and 4
POMS	Pipeline Operating Management System
ROW	Right of Way
SCADA	Supervisory Control and Data Acquisition
SEO	Statement of Environmental Objectives
SEP	South East Pipeline
SES	State Emergency Service
SMS	Safety Management System
TJ	Terra Joule

## 1.0 PURPOSE

This report is submitted in accordance with the requirements of Pipeline Licence 3, Pipeline Licence 4 and the SA Petroleum Regulations 2000.

## 2.0 SCOPE

The South East Pipeline system is owned, operated and maintained by Epic Energy.

This report reviews operations carried out during 2004 and intended operations for 2005 to 2006. In accordance with the Petroleum Regulations, a performance assessment is also provided with regard to the Statement of Environmental Objectives for the South East Pipeline.

The design parameters for the SEP are as follows:

### **Katnook – Kimberley Clarke Pipeline [Pipeline Licence 4]**

<b>Date Constructed</b>	<b>1990 – 1991</b>
<b>Date Commissioned</b>	March 1991
<b>Length, km</b>	46.1 Kilometres
<b>Diameter (OD), mm</b>	168.3 mm
<b>Wall Thickness, mm:</b>	
- <b>Normal</b>	4.2 mm
- <b>Special Crossings (eg: rivers, roads, railways)</b>	5.00 mm
- <b>MLV's</b>	
<b>Pipe Grade</b>	API 5LX 42
<b>MAOP, kPa</b>	10,000 kPa
<b>Coating</b>	Yellow Jacket
<b>Main Line Valves</b>	3
<b>Actuators</b>	Manual
<b>Compressor Stations</b>	Nil
<b>Meter Stations</b>	Kimberley Clarke

The Kimberley Clarke pipeline runs from the Epic Energy site, adjacent to the Katnook production plant, to a meter station near Tantanoola. The cathodic protection system is sacrificial anodes and the pipeline was constructed with Zaplock joints. The pipeline has pig trap facilities at Katnook and Kimberley Clarke and a MLV midway along the pipeline at Glencoe.

### **Glencoe – Mount Gambier Lateral [Pipeline Licence 4]**

<b>Date Constructed</b>	<b>1990-1991</b>
<b>Date Commissioned</b>	April 1991
<b>Length, km</b>	18.9 Kilometres
<b>Diameter (OD), mm</b>	168.3 mm
<b>Wall Thickness, mm:</b>	
- Normal	4.2 mm
- Special Crossings (eg: rivers, roads, railways)	5.00 mm
- MLV's	
<b>Pipe Grade</b>	API 5LX 42
<b>MAOP, kPa</b>	10,000 kPa
<b>Coating</b>	Yellow Jacket
<b>Main Line Valves</b>	2
<b>Actuators</b>	Manual
<b>Compressor Stations</b>	Nil
<b>Meter Stations</b>	Mount Gambier

The Mount Gambier Lateral runs from Glencoe, midway along the Katnook to Kimberley Clarke Pipeline, to a meter station on Nick Lyon Road, Mount Gambier. The cathodic protection system consists of sacrificial anodes and the pipeline was constructed with Zaplock joints. The pipeline has pig trap facilities at Glencoe and the Mount Gambier meter station.

**Nangwarry Lateral [Pipeline Licence 4]**

<b>Date Constructed</b>	<b>2001</b>
<b>Date Commissioned</b>	August 2001
<b>Length, km</b>	11.5 Kilometres
<b>Diameter (OD), mm</b>	88.9 mm
<b>Wall Thickness, mm:</b>	
- Normal	3.2 mm
- Special Crossings (eg: rivers, roads, railways)	4.00 mm
- MLV's	
<b>Pipe Grade</b>	API 5LX 56
<b>MAOP, kPa</b>	9850 kPa
<b>Coating</b>	Yellow Jacket
<b>Main Line Valves</b>	Upstream & downstream isolation valves
<b>Actuators</b>	Manual
<b>Compressor Stations</b>	Nil
<b>Meter Stations</b>	Nangwarry

The Nangwarry Lateral runs for 11.5 kilometres from a take off on the 150mm Katnook to Kimberley Clarke pipeline near Kalangadoo, to a meter station at Nangwarry. The lateral is protected with sacrificial anodes, is buried at a minimum depth of 1000mm and 1200mm at crossings and has welded joints. The pressure in the lateral is reduced to 2000kPa at a regulator off take station near Kalangadoo.

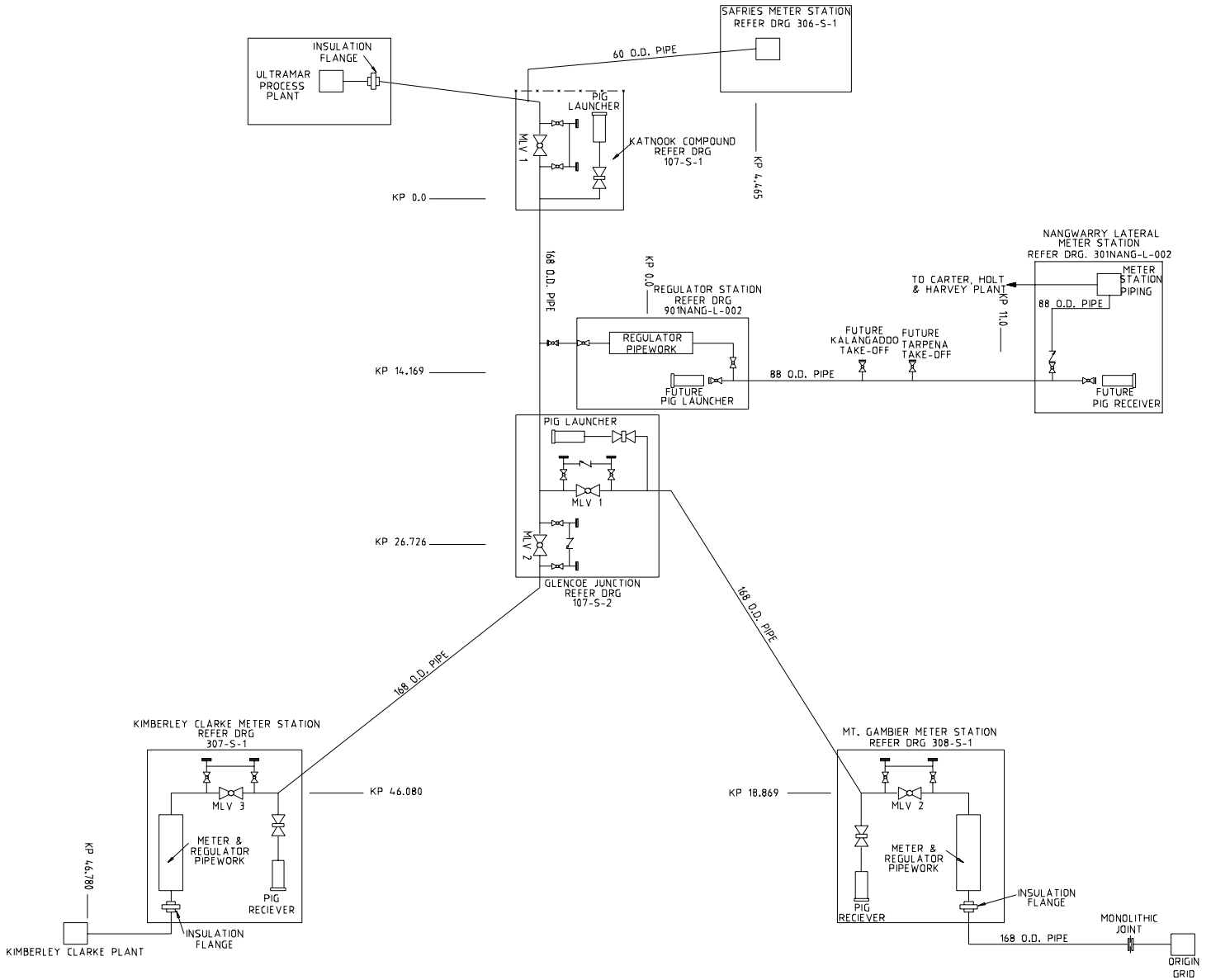
**Safries Lateral [Pipeline Licence 3]**

<b>Date Constructed</b>	<b>1990</b>
<b>Date Commissioned</b>	January 1991
<b>Length, km</b>	4.5 Kilometres
<b>Diameter (OD), mm</b>	60.3
<b>Wall Thickness, mm:</b>	
- Normal	3.9 mm
- Special Crossings (eg: rivers, roads, railways)	3.9 mm
- MLV's	
<b>Pipe Grade</b>	ASTM A106 Gr B
<b>MAOP, kPa</b>	10,000 kPa
<b>Coating</b>	Yellow Jacket
<b>Main Line Valves</b>	Upstream and downstream isolation valves
<b>Actuators</b>	Manual
<b>Compressor Stations</b>	Nil
<b>Meter Stations</b>	Safries

The Safries Lateral runs for 4.5 kilometres from the Epic Energy Katnook site, adjacent to the Katnook production plant, to a meter station in the Safries Pty Ltd property, situated on the Penola to Mount Gambier Road. The pipeline cathodic protection system is sacrificial anodes and the pipeline has welded joints.



2.1 Pipeline Route and Facilities Schematic



PIPELINE ROUTE AND FACILITIES DIAGRAM

## 3.0 PIPELINE INTEGRITY MANAGEMENT

### 3.1 Pipeline Inspections and Assessment



- To ensure compliance with AS2885 and meet pipeline licence requirements, all routine road patrols and above ground facility inspections were performed as scheduled by Epic Energy's first response contractor located in the area. Additional patrols are conducted by Dry Creek based Field Maintenance Officers, in combination with scheduled maintenance visits to the region.
- A licensed contractor, in accordance with AS3788, conducted pressure vessel inspections, both internal and external. Written reports were provided for all inspections. There were no significant issues highlighted as a result of the inspections.

An authorized contractor for the South East Pipeline system performed routine fire extinguisher inspection and maintenance, in accordance with Australian Standards.

Excavation and inspection of one defect was completed in March 2004. There was also an inspection of 2 "Zaplock" joints and "Canusa" shrink sleeves which showed that the Zaplock joints were in sound condition and that the pipe underneath the shrink sleeves was in good condition, also showing no signs of deterioration. A number of welds under shrink sleeve were also checked and found to be in good condition.

#### 3.1.1 Leakage Surveys & Detection

There were no dedicated "Leak Detection Surveys" conducted on the South East Pipeline system during 2004. However, routine patrols, site inspections and regular maintenance visits by field maintenance staff contribute to pipeline leak detection.

Monitoring of station flows, operating pressures, temperatures and valve statuses via TSCC, also contributes to pipeline facility integrity.

There were no uncontrolled gas leaks reported for the South East Pipeline system during 2004.

### **3.1.2 Pipeline Wall Defect Assessment**

A Pipe Wall Defect Survey was not carried out during 2004. As detailed later within this report, an “Intelligent Pigging” program was budgeted and scheduled for completion during 2004 but was postponed due to an incident at the Kimberly Clark meter station. This program will now take place in early 2005.

## **3.2 Stress Corrosion Cracking Investigations**

### **3.2.1 External Surfaces**

No investigations into “Stress Corrosion Cracking” (SCC) were undertaken on the South East Pipeline system during 2004. The SEP is a free flowing pipeline, with a MAOP of 10,000kPa and 9,850kPa for the Nangwarry Lateral. Pipeline operating pressures are consistently within the range of 4,000–6,500kPa, with the Nangwarry Lateral operating at 2,000 kPa as a result of the pressure reduction station installed near the Kalangadoo takeoff.

## **3.3 Verification of Intelligent Pig Features:**

Defect verification assessments were not undertaken on the South East Pipeline system during 2004. An “Intelligent Pigging” program has been scheduled and budgeted for completion in early 2005.

## **3.4 Coatings**

Following the DCVG survey performed in late 2003, an excavation and inspection of one defect at kp11.0 was identified and completed in March 2004. The inspection found no coating defect on the pipe in the inspected area. The IR drop discovered by the DCVG survey was attributed to a split in the insulation on a CP test post cable.

While the pipe was exposed, inspections of 2 “Zaplock” joints and “Canusa” shrink sleeves were performed. The inspections confirmed that the Zaplock joints and the pipe under the shrink sleeves showed no form of external corrosion or deterioration. A number of welds under shrink sleeve were also checked and found to be in good condition.

## **3.5 Pipeline Cathodic Protection**

To mitigate corrosion, the South East Pipeline is coated with a protective, extruded butyl mastic and polyethylene coating system, which serves to isolate the external pipeline surfaces from corrosive elements in the surrounding environment. Field joints are coated with a polyethylene backed, butyl mastic tape system. Secondary protection at coating holidays and imperfections is achieved by applying cathodic protection.

The cathodic protection system of the South East Pipeline is of a sacrificial type and consists of magnesium anodes on the Kimberley Clarke, Mt. Gambier and Safries Laterals. The Nangwarry Lateral consists of zinc anodes.



Lightening Protection Nangwarry

### **Performance**

The effectiveness of the cathodic protection system is monitored by carrying out two full line potential surveys annually. The protection levels are assessed according to the criteria set by AS2832.1-1998.

Potential profiles of the SEP, taken in March 2003, together with the last survey in October 2003, are given in Annex B. These profiles show that:

#### *Kimberley Clarke Pipeline*

The potential profiles of this pipeline indicate that it is fully protected along its entire length. The laterals total protective current demand was 34.1mA, which is equivalent to approximately 1.4 micro A/M2 - a low current demand indicating a good pipeline coating system.

#### *Mt Gambier Lateral*

The potential profiles of this lateral indicate that the pipeline was fully protected and polarised to the cathodic protection criteria on its entire length. The protective current demand for the lateral was 20mA, which is equivalent to 1.9 micro A/M2. This indicates that the pipeline coating is in good condition.

#### *Safries Lateral*

The potential profiles of this lateral indicate that the pipeline is fully protected and polarised to the cathodic protection criteria on its entire length. The protective current demand for the lateral was 28.0mA, which is equivalent to 33.0 micro A/M2. The last survey reports indicated a high current demand that was probably due to a short to the copper pipes down stream of the metering station.

#### *Nangwarry Lateral*

The potential profiles of this lateral indicate that the pipeline was fully protected and polarised to the cathodic protection criteria on its entire length. The protective current demand for the lateral was 88.3mA, which is equivalent to 11.4 micro A/M2. The last survey reports indicated a high current demand that was probably due to a short to the copper pipes down stream of the metering station.

**Internal Corrosion/Impurities**

As the gas in the South East Pipeline system is free from corrosive species, internal corrosion is not a significant issue on this system. Routine mercury sampling is carried out within the gas streams and on liquids contained within coalescing filter vessels. Results obtained from analysis are consistently below recommended exposure limits, however, a safe work procedure has been implemented requiring the use of specific personal protective equipment (PPE) when any personnel are carrying out maintenance tasks which may involve exposure.

**Coating Condition**

The condition of the pipeline coating is monitored by five-yearly DCVG surveys on the pipeline. The last survey was conducted in June 2003.

**DCVG Surveys and Pipeline Excavations**

A defect, identified as part of the DCVG survey, has been identified for excavation on the Glencoe to Mt. Gambier Lateral. All other locations, as detailed in the report attached in Annex C, have been confirmed as pipeline anchor blocks. The defect was excavated in March 2004.

The defect detail is outlined below;

Latitude	Longitude	% IR Drop	Remarks
<b>Glencoe Junction – Mt Gambier</b>			
-37.722296	140.725925	24	Wandillo Rd.

**Conclusion on Pipeline Condition**

*Pipeline Coating Condition*

The low protective current density of the laterals indicates that their coating system is in good condition. Higher than average current demand on the Safries and Nangwarry Laterals encountered in the last surveys will be investigated.

*Cathodic Protection System*

Monitoring cathodic protection parameters, including the potential profiles of the South East Pipeline System, has indicated that the cathodic protection system is providing the system with adequate protective currents to polarise them to the criteria levels, as set by Australian Standards and Epic Energy’s maintenance requirements. CP Potential profiles are included in this report in Annex 1.

*Pipeline Integrity*

An ongoing history of low current demand and polarised potential levels on the South East Pipeline System, indicate that the pipeline is in good condition, free of corrosion and is capable of operating at set parameters with no restrictions.

### 3.6 Pipeline Potential Profiles

Annex C, attached at the end of this report, contains Pipeline Potential trends, which have been collated during the Full Line Surveys, conducted during the March and September 2004. The trends show that the pipeline system is fully protected as previously stated.

### 3.7 Electrical and Instrumentation



Coriolis Meter

- Accuracy Verification Testing was completed in accordance with customer agreements, on a three monthly basis at all meter stations on the South East Pipeline System.
- Customer representatives attended AVT's at several locations throughout 2004.
- All AVT results are documented and filed within the Central Filing System. All reports, summaries of activities and calibration certificates are forwarded to Origin Energy.

Electrical compliance testing was carried out on all portable electrical equipment and residual current devices (RCD's) at all sites, in accordance with AS3760 and the OHS&W Act 1995.

Routine 6 monthly maintenance tasks involved the inspection, testing and calibration of all non-billing transmitters station battery systems and associated station instrumentation. No electrical or instrumentation faults were reported on the pipeline system in 2004.

#### 3.7.1 Signage

Signage on the South East Pipeline system is maintained in accordance with the requirements, as stated in AS2885.

Pipeline and compound signage is addressed as part of the routine patrols carried out by the South East Contractors. Additional signage audit checks are carried out by Epic Energy's Field Maintenance Officers on a regular basis, in conjunction with scheduled maintenance visits.

As a result, pipeline warning signs and sign posts were replaced/repared throughout the year to maintain good line of sight.



### 3.7.2 Pressure Control and Protective Equipment

Routine inspection and maintenance was carried out on the pressure regulation/pressure relief systems at all South East Meter Stations on a 6 monthly basis during 2004.

Maintenance tasks for the pressure control systems consisted of the inspection/overhaul of regulator seats, pilots and instrumentation filters to ensure correct operation of set points of the active/monitor and bypass regulation systems.

Pressure Safety Valves are also checked in conjunction to confirm correct set point, operation and alarming functions. Where applicable, overpressure isolation valve functions are tested to ensure satisfactory operation.

All routine 6 monthly maintenance is documented via Epic Energy's computerized asset management system (Maximo) and file copies are located within the central filing system.

There was one pressure regulator failure recorded at the Kimberley Clark meter station in 2004. This resulted from large volumes of dust contaminating the pipework and equipment during a pigging exercise. Epic Energy personnel were on site and rectified the fault eliminating overpressure relief systems venting gas to atmosphere.

### 3.7.3 Site Security

The South East Pipeline system is secured in accordance with Epic Energy's standard policies, in that all critical valves, compounds and control huts are locked with a "common lock" system. All above ground facilities are located within a two-meter high chain mesh fence with three strands of barbwire.

Valve status, station operating parameters and building 'entry' alarms are monitored via the SCADA system.

Routine patrols, site inspections and regular maintenance visits throughout the year, on all facilities on the pipeline system, did not highlight any areas of concern, vandalism or security breaches during 2004.



### 3.7.4 Structures

All buildings and structures are inspected and maintained as part of routine maintenance procedures are in sound condition.

### 3.8 Communications

There were only minor outages encountered in 2004, all relating to faults within the Telstra infrastructure.

### 3.9 Mechanical



- All routine mechanical maintenance activities were completed as scheduled on the South East Pipeline system during 2004. This work involved MLV servicing, station dust filter inspection/replacement, door closure maintenance, coalescing filter inspection/maintenance and pig launcher/receiver maintenance.

A test between the compatibility of a “Plidco” split sleeve and “Zaplock” field joint was conducted. The conclusion was that as a result of the Zaplock jointing method and the associated flares, the existing 6” Plidco repair sleeve is not suitable to be used as a temporary repair strategy, as the clamp contacts the pipe-work Zaplock flare section, leaving too large a gap for the sealing faces. An alternative method/ clamp is to be investigated. A leaking Zaplock joint will be treated the same as any major pipeline leak and the emergency repair method will be to cut out and replace a section of pipeline.

No major mechanical failures were reported for the South East Pipeline during 2004.



### 3.10 Ancillary Equipment

All station pipe supports, valves and pig trap facilities were inspected and maintained as part of routine maintenance activities carried out during 2004, with no outstanding actions to report.



### 3.11 Results, Analysis and Remedial Action Taken

Results from routine inspections are reviewed by the technical services group to ensure that any problems or issues that may have been overlooked are identified and addressed by the maintenance staff or forwarded onto engineering for further technical analysis.

If a problem requires a system design change to be made, the maintenance staff, field technical services group or engineering will put forward the proposed modification using the design change process. This process is one of review and formal acceptance and sign off by the engineering group.

As a result of the routine maintenance activities of the field staff or due to the day-to-day operation of the pipeline, numerous corrective action maintenance tasks are identified in the course of a year.

All of the tasks identified are investigated, corrective actions specified, the task prioritized by the maintenance staff and entered into “Maximo” along with all equipment, parts and support equipment needed to complete the job.

The planning group using “Maximo” information then schedule the corrective action maintenance tasks into the maintenance teams work load using a work order system. Corrective maintenance activities are prioritized using a three step process as follows,

- Priority three (3) faults will be addressed within twenty four (24) hours,
- Priority two (2) faults will be addressed within ten (10) days
- Priority one (1) faults will be addressed within six (6) weeks

During 2004, 29 corrective maintenance tasks were addressed using the above technique.

## 4.0 THREAT MITIGATION

### 4.1 Surveillance

Permanent contractors based in the South East region carry out routine road patrols monthly on the South East Pipeline system in accordance with the Pipeline License and AS2885.3.

Additional patrols are also scheduled after heavy rainfalls to check for signs of erosion or other irregularities.

Regular routine maintenance visits by Field Maintenance Officers from Dry Creek, also provides an opportunity for additional patrols and the ability to monitor contractor performance, in relation to patrols, signage and land management issues.

The majority of items identified as part of the routine patrols related to the replacement of signage and the monitoring of third party activities in the vicinity of the pipeline easement.

### 4.2 Maintenance Programs

The maintenance program outlines the maintenance requirements to ensure the integrity and reliability of the pipeline and associated infrastructure. In 2004, all preventative maintenance tasks within the maintenance plan (Maximo) were reviewed to ensure compliance with the Epic Energy Maintenance Program, AS 2885.3, Pipeline License and any customer contractual obligation. Several changes resulted in the task frequencies and work instruction documents.

### 4.3 Marking

Signage on the South East Pipeline system is installed and maintained in accordance with AS2885.3. Compound signage incorporates “HAZCHEM” identification, facility ownership and contact details in the event of an emergency, via a toll free number. “Line of Sight” checks are carried out as part of routine pipeline patrol activities, with ongoing signage replacements as required.

### 4.4 External Interference Prevention

#### 4.4.1 Pipeline Location Service

Epic Energy provides a free service to locate pipelines for which they are responsible. The service is primarily used by other companies carrying out civil works in the vicinity of any pipelines administered by Epic Energy.

There were 24 pipe locations carried out for third parties on the South East Pipeline system in 2004. All locations were supervised by Epic Energy contractors for third party activity within the pipeline easement, mainly for new and replacement fences and vehicles working within the easement boundaries.

Epic Energy is a founding member of the “SA/NT Dial Before You Dig” organization. Use of the service by contractors helps to improve the protection of the pipeline from unauthorised 3<sup>rd</sup> party activities.

#### 4.5 Landholder Contacts

There are five landowners and occupiers along the Safries Pipeline, 75 landowners and occupiers along the South East Pipeline and 12 landowners on the Nangwarry Lateral.

All landholders/occupiers were visited by the Land Management Officer in 2004.

Contacts are also made by Field Maintenance Officers, the local contractor and Superintendents, during the course of daily business. Any issues that may occasionally arise are recorded in the Land Management System for follow up and review.

Land management is supported by Epic Energy's dedicated GIS. It provides a powerful database and MapInfo facilities. Notes relating to discussions, all property details, including issues with the property owners, are recorded in the Land Management System (LMS). Through its MapInfo facility, an image of the cadastral boundaries of each property, relative to the pipeline route, can be displayed for any land parcel. 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 contacted by letter or telephone. 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 a "landowner pack" containing a Dial Before You Dig information bag, pipeline safety brochure, a complimentary biro, cap, drink holder, as well as the annual pipeline safety awareness calendar, which is individually mailed out or handed personally to the occupier.



## 4.6 Community Awareness

Epic Energy holds pipeline safety awareness meetings with communities along the pipeline route.

Meetings are generally held on an annual basis. The target audience is contractors, utilities, members of Country Fire Service (CFS), Metropolitan Fire Brigade (MFS), Police, Ambulance, SES and Councils. Community members are also invited to attend.

The focus of the awareness presentation is on Epic Energy's background, properties of natural gas, how a pipeline operates, emergencies – how to identify hazards and leaks, what to do to prevent hazards occurring and what process to follow (Dial Before you Dig 1100), if you wish to undertake works in the easement.

Presentations were given in January 2004 to the Shire Council, CFS, SES and the Police Department.

## 5.0 MANAGEMENT

### 5.1 Risk Assessments

#### 5.1.1 Risk Assessment

As part of the risk assessment process, a hazard and operability [HAZOP] study of all above ground facilities on the South East Pipeline system was carried out in 2001 using an external facilitator. This study was reviewed and determined not to meet Epic Energy's current standard. Consequently, a new HAZOP of all above ground facilities on the system was carried out December 2002.

As a result of the HAZOP's, 128 action items were identified. The actions were grouped into specific categories, such as "common" and "site specific" actions. All of the action items have been accessed and classified as improvements to the facilities and/or systems.

A status report relating to the HAZOP actions was forwarded to PIRSA early in 2004.

#### 5.1.2 AS2885 Risk Assessment

No formal AS2885 risk assessments were carried out on the South East Pipeline system during 2004. However, action items identified as part of the process carried out in July 2001 and April 2002, continue to progress and are monitored.

Examples of action items completed from the risk assessment are as follows.

- Inspection of a "Canusa Shrink Sleeve", installed to provide corrosion protection for field joints, was completed in March 2004 (as detailed above in section 3.8 – Mechanical).
- An AC Induction Survey to investigate the effects of induced currents as a result of high voltage power lines was completed in February 2004.

## 5.2 Management Systems

### 5.2.1 Reports Generated in 2004

The following reports were generated and forward to PIRSA during 2004:

- PL3/4 Annual Report for 2003, forwarded February 2004
- Emergency Exercise (Exercise Blue Lake) Close Out Report, Forwarded October 2004
- 2004 Risk Assessment Close Out Report
- HAZOP Report

### 5.2.2 2005 One-Off Activities

- An Intelligent Pigging Program has been budgeted and scheduled for completion in March 2005.
- The implementation of the proposed modifications at the Mount Gambier meter station to automatically switch the bypass regulator run into service in the event of a duty monitor/active regulator fail. Subject to project final approval.
- A “Safety and Operating Plan” to be developed for the South East Pipeline system in the first half of 2005.
- Modifications to the Kimberley Clark metering as a result of the report into the effects of “low temperature on pipeline materials”. This study is being carried out in conjunction with Worley Engineering and the project initiation will be subject to project approval.
- Preliminary works relating to the completion of an AS2885 Risk Assessment, scheduled for completion prior to July 2006, will be undertaken during the later stages of 2005.

### 5.2.3 2006 One-Off Activities

- Possible additional works scheduled for 2006 will be as a result of the intelligent pigging integrity program, following data analysis and will involve the excavation/inspection of the pipeline.
- Emergency Exercise.
- 2006 will see the completion of a pipeline risk assessment, in accordance with AS2885.1 and HB105-1998.

### 5.2.4 Volume of Product Transported

Approximately 2,845 TJ of natural gas was transported through the South East Pipeline in 2004.

### 5.2.5 Statement of Expenditure

Commercial In Confidence.

### 5.3 Emergency Response

Pipeline Licence 3 and 4 states that an emergency exercise is conducted on the South East Pipeline System every two years.

Epic Energy satisfies these requirements by conducting a minimum of two emergency exercises annually in South Australia. In order to maintain and further refine our emergency response preparedness, to gain a broader understanding of response requirements, roles and responsibilities within the scenarios are varied.

Exercise BLUE LAKE was conducted at Mount Gambier on Tuesday 22<sup>nd</sup> June 2004

#### Emergency Response Objectives

To practice the response of Epic Energy personnel and South East contracted staff to an incident at an Epic Energy site involving damage to high pressure gas pipeline, injury to personnel and involvement of Emergency Services personnel.

To practice the response and coordination of Police and Emergency Service personnel when dealing with damage/hazard from high pressure gas pipelines.

To test and practice communication links and information flow between the incident site, Epic Energy Dry Creek Incident command room, TSCC and the Police and Emergency Services.

To practice the set up and running of the Dry Creek Incident Command center, with nominated staff taking on the different rolls, in the resolution of the incident.

To evaluate Epic Energy's emergency response plan.

#### 5.3.1 Emergency Response Incidents

There were no emergency response incidents to report for the South East Pipeline system for 2004.

#### 5.3.2 Emergency Response Exercises

The emergency exercise carried out in 2004 was deigned to practice Epic Energy's safety procedures in the event of an accident involving the high-pressure gas pipe line supplying the township of Mount Gambier from the South East gas pipe line.

Exercise BLUE LAKE was conducted at Mount Gambier on Tuesday 22<sup>nd</sup> June 2004, commencing at 1000 hours.

The exercise was confined to the Mount Gambier gas meter station on Nick Lyon Road, on the north side of Mount Gambier. The exercise scenario was developed to the stage where the Mount Gambier gas supply was notionally curtailed for a period of approx 27 hours. Included in the scenario was escaping gas and fire requiring measures to minimize environmental and public health and safety issues.

The objectives of this exercise were to:

- Test the response of Epic Energy personnel and SE contracting staff.
- Test the response and coordination of the Police and Emergency Services in the area.

- Test and practice the communication links and information flow between Epic Incident Command Room, TSCC and Emergency Services.
- Test and practice the set up and operating of the Dry Creek Incident Command Room with nominated staff in different roles.
- To evaluate the Epic Energy Emergency Response Plan.



## 5.4 Incidents and Corrective/Preventative Action

### 5.4.1 Incidents

There was one incident reported on the South East Pipeline System in 2004.

On 28<sup>th</sup> November, there was an incident at the Kimberley Clark meter station caused by dust resulting from a pigging program entering the meter station pipework and contaminating equipment.

The excessive dust filled the filter inlet vessel, collapsing the filter elements. Dust continued into the pipe skid and resulted in regulators failing and the over pressurization system activating. The downstream filter separation vessel was also effected.

On opening the filter vessel doors and on removing the contaminated filter elements, spontaneous combustion caused the elements to ignite when removed from the vessel.

Pigging operations have been suspended until the pre-dust collection pipework system has been suitably modified, work instructions have been

reviewed and modified and additional equipment has been purchased. An incident investigation being carried out by Epic Energy is ongoing.

## 5.5 Reported Incidents

PIRSA and Workplace Services have been advised of the incident identified in section 5.4.1. This incident was reported firstly as an operational incident and eventually developed into a L.T.I.

During 2004, there were no reports relating to easement encroachments, venting gas, low station pressures or customer complaints for the South East Pipeline System.

## 5.6 Audits

### 5.6.1 Operational Audits

No operational audits were conducted on the South East Pipeline system during 2004.

### 5.6.2 Environmental Audits

Whilst no external environmental audit was carried out during the year, internal processes including ground patrols and landowner contact provided a complete coverage of the environmental status of the South East Pipeline system.

An audit of the Epic Energy Environmental Management System was due in November 2004. This audit was not completed and has been re-scheduled by the Risk Management Coordinator to be carried out in March 2005.

### 5.6.3 Safety Audits

The safety audit process was taken into consideration in the internal audit framework review referred to above. Audits of safety management will continue to be undertaken in line with the Safety Management System (SMS).

## 5.7 Performance Measurement and Analysis of Results

### 5.7.1 Maintenance Performance

In 2004, 186 Maintenance tasks were scheduled on the South East Pipeline system from Epic Energy's computerised maintenance management system (Maximo). The tasks were completed by Dry Creek based Field Maintenance Officers or permanent contractors based in the South East region. The ratio between preventative and corrective maintenance tasks is detailed below;

- 78% Preventative Maintenance tasks; and
- 22% Corrective Maintenance tasks.

### 5.7.2 Key Performance Indicators

The following key performance indicators have previously been established to monitor performance of operations and maintenance activities on the South East Pipeline system. Outlined below are the KPI results for 2004.



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	<b>2004 target</b>	<b>2004 actual</b>	<b>2004 Comment</b>
<b>Cathodic Protection</b>			
1. Percentage of Pipeline that has an off pipe to soil potential greater than -850 mV (Winter)	95%	100%	Met Target
2. Length of the pipeline protected to the AS 2885 level	95%	100%	Met Target
<b>Third Party Incident</b>			
1. Number of times pipeline is damaged	0	0	No damage occurred to the pipeline during the reporting period.
2. Number of near misses (digging within 1m of pipeline)	0	0	No activities of this nature that involved Epic Energy, the owner or any third party were identified during the reporting period.
3. Exposure of pipeline due to washout and wind erosion	0	0	During this reported period there were no instances of pipeline cover being reduced due to wind or water erosion.
<b>Unplanned Gas Releases</b>			
1. Number of Relief valve/vent discharges	0	1	There was one unplanned relief valve operation in 2004. This resulted from an incident at Kimberley Clark meter station, gas vented was minor, personnel on site to rectify the fault immediately.
2. Number of pipeline leaks (more than 200 m3/hr)	0	0	No pipeline leaks were detected on the pipeline system during 2004.
3. Amount of gas discharged (m3)	<500scm	<500scm	Target achieved
<b>SCADA</b>			
1. Reliability of SCADA	99.5%	96.94%	Scada reliability based on a rolling 3 monthly average. Scada performance is heavily reliant on external infrastructure.

**5.8 Review and Improvement**

In line with the requirements of AS2885.3, to ensure that employees are trained and competent to carry out their tasks, Epic Energy continues to employ the services of Leng Saw from Romeo Consulting, as its dedicated training provider/co-ordinator. This ensures a structured approach in regards to training needs identification and the delivery of services.

Training that was undertaken by field maintenance officers directly responsible for maintaining the South East Pipeline system during 2004 is outlined below.

- Workzone Traffic management training.
- “First 5 Minutes” Fire training
- Routine Senior First Aid re-certification training
- “POMS” awareness training
- Ongoing “On the Job” training of permanent contractors in the South East Region.
- 4WD Training.

### 5.8.1 Compliance Issues

Every endeavor is made to ensure that design, manufacture, construction, operation, maintenance and testing of all appropriate facilities is carried out in accordance with AS2885. Any non-compliance identified is logged in Epic Energy's computerized maintenance management system (Maximo), where they are tracked to conclusion. Significant items are reported directly to PIRSA.

A Statement of Environmental Objectives (SEO's) for PL3/4 was gazetted on 24<sup>th</sup> June 2004.

The specific objectives declared in the draft SEO's have been assessed. The results of that assessment are provided in Annex A.

### 5.8.2 Actions to Rectify Non-Compliance

No significant compliance issues are outstanding. Action items identified as part of the HAZOP study and AS2885 risk assessment have been assessed and prioritised, with a plan in place to address the remaining action items. Several items have been addressed as part of recent upgrade projects as detailed in section 5.1.1.

## 6.0 CONCLUSIONS

Pipeline coating programs, cathodic protection monitoring, routine maintenance and inspection programs carried out on the South East Pipeline system during 2004, indicate that the pipeline is in sound condition and is capable of operating at set parameters with no restrictions.

Cathodic Protection Survey results, as supplied in Annex B, indicate all areas of the pipeline system met the target performance levels of protection.

The "Fitness For Purpose" report, completed during 2003, in which all areas of the pipeline system were reviewed, further reinforces the above statement.

## **7.0 ANNEX A – ASSESSMENT OF DECLARED OBJECTIVES**

### **ANNEX A**

### **ASSESSMENT OF DECLARED OBJECTIVES**

**2004 PL3/4 ANNUAL REPORT**

**DATED FEBRUARY 2005**

## ASSESSMENT OF DECLARED OBJECTIVES

### South East Pipeline Objectives and Assessment Criteria<sup>1</sup>

OBJECTIVE	GOAL	MEASURE/HOW	ACHIEVED/NOT ACHIEVED	COMMENTS
1. To avoid unnecessary disturbance to 3 <sup>rd</sup> party infrastructure, landholders or land use	1.1 To minimise disturbance or damage to infrastructure/land use and remediate where disturbance cannot be avoided	Disturbance to infrastructure (eg. such as fencing or access tracks) occurs less than once every five years.	Achieved	There were no disturbance or damage to 3 <sup>rd</sup> party infrastructure, landowners or land use, as a result of pipeline operations
	1.2 To minimise disturbance to landholders	Access to private property occurs more often than once a year in accordance with landowner agreements.	Achieved	Refer to 1.1
2. To maintain soil stability/ integrity	2.1 To remediate erosion as a result of pipeline operations in a timely manner	The extent of soil erosion on the easement was consistent with surrounding land.	Achieved	The pipeline is routinely patrolled with no erosion or soil inversions detected as part of this activity. Excavations of the pipeline were carried out to Epic Energy policies and procedures.
	2.2 To prevent soil inversion		Achieved	Refer to 2.1
3. To maintain native vegetation cover on the easement	3.1 To maintain regrowth of native vegetation on the easement to be consistent with surrounding area	The presence of weeds and pathogens on the easement was consistent with adjacent land.	Achieved	The native vegetation within the pipeline easement is consistent with surrounding environment

<sup>1</sup> Assessment criteria have been developed to be “black and white”. Professional judgement is required to assess whether non-compliance is minor or major. It is necessary to ensure that adequate information is available to enable this judgement to be made.

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OBJECTIVE	GOAL	MEASURE/HOW	ACHIEVED/NOT ACHIEVED	COMMENTS
	<b>3.2</b> To minimise additional clearing of native vegetation as part of operational activities	Species abundance and distribution in such areas was consistent with the surroundings.  Follow-up restoration work undertaken as necessary	Achieved	Excavation activities of the pipeline were carried out to Epic Energy's policies and procedures. Areas of excavation had no impact on native vegetation.
	<b>3.3</b> To ensure maintenance activities are planned and conducted in a manner that minimises impacts on native fauna	Vegetation clearing within the easement or on land adjacent to the easement is limited to previously disturbed areas or areas assessed to be of low sensitivity, unless prior regulatory approval obtained.	Achieved	Refer to 3.2
<b>4.</b> To prevent the spread of weeds and pathogens	<b>4.1</b> To ensure that weeds and pathogens are controlled at a level that is at least consistent with adjacent land	The presence of weeds and pathogens on the easement was consistent with adjacent land.	Achieved	The presence of weeds and pathogens on the easement is consistent with adjacent land
<b>5.</b> To minimise the impact of the pipeline operations on surface water resources	<b>5.1</b> To maintain current surface drainage patterns	The presence of surface drainage patterns on the easement was consistent with adjacent land.	Achieved	There were no alterations to existing landscapes or drainage patterns during 2004
<b>6.</b> To avoid land or water contamination	<b>6.1</b> To prevent spills occurring, and if they occur minimise their impact	Spills minimised.	Achieved	No spills recorded in 2004

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OBJECTIVE	GOAL	MEASURE/HOW	ACHIEVED/NOT ACHIEVED	COMMENTS
	<b>6.2</b> To ensure that rubbish and waste material is disposed of in an appropriate manner.	Rubbish and waste material removed off-site as part of routine maintenance and patrol duties.	Achieved	Rubbish removal is scheduled and carried out during routine maintenance activities
	<b>6.3</b> To prevent impacts as a result of waste water disposal	No waste water.	Achieved (no waste water)	There is no waste water on the SE pipeline system
<b>7.</b> To minimise the risk to public health and safety	<b>7.1</b> To adequately protect public safety during normal operations	The pipeline easement was clearly identified by signs that had been installed in accordance with AS2885. A comprehensive landowner liaison program was implemented. An Emergency Response Plan was in place and staff were adequately trained.	Achieved	In 2004 signage was upgraded as part of the routine pipeline patrols, and all landowners on the pipeline were visited by the Epic Energy land management officer.  An emergency exercise drill was carried out at the Mount Gambier meter station to test procedures and train personnel.
	<b>7.2</b> To adequately protect public safety during maintenance	All affected and adjacent landowners were advised of the nature and schedule of maintenance activities. All potentially hazardous areas were signposted or marked with bunting. Adequate traffic management practices were implemented. There were no injuries or near misses involving the public.	Achieved	Safety system including work instructions, permit to work and job hazard analysis contribute to reach this objective.

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OBJECTIVE	GOAL	MEASURE/HOW	ACHIEVED/NOT ACHIEVED	COMMENTS
	<b>7.3</b> To avoid fires associated with pipeline maintenance activities	Fuel load on the easement was consistent with adjacent land. All operations personnel were trained in fire safety procedures. No project related fires have occurred.	Not Achieved	An incident at the Kimberley Clark meter station resulted in filter elements igniting from spontaneous combustion.  All field staff have received “ First 5 Minute “ fire training
	<b>7.4</b> To prevent unauthorised activity on the easement that may adversely impact on the pipeline integrity	Refer to section 4.4.1 for further detail.	Achieved	There were no report easement encroachments during 2004
<b>8.</b> Minimise impact of emergency situations	<b>8.1</b> To minimise the impact as a result of an emergency situation or incident	No emergency response incidents reported during 2004.	Achieved	No emergency response incidents reported during 2004
	<b>8.2</b> To restore any damage that may occur as a result of an emergency situation	No emergency response incidents reported during 2004.	Achieved	No emergency response incidents reported during 2004
<b>9.</b> To minimise noise due to operations	<b>9.1</b> To ensure operations comply with noise standards	Operational activities comply with noise regulations, under the Environment Protection Act 1993. No complaints were received.	Achieved	No complaints received. The relief valve lifted at Kimberley Clark for a short period, personnel on site and rectified the fault immediately.
<b>10.</b> To minimise atmospheric emissions	<b>10.1</b> To eliminate uncontrolled atmospheric emissions	Emissions were kept to an acceptable level for the life of the pipeline. No complaints were received from the public.	Achieved	KPI met. The relief valve lifted at Kimberley Clark for a short period, personnel on site and rectified the fault immediately.
	<b>10.2</b> To minimise the generation of dust.	Dust minimisation procedures followed.	Achieved	Operation and maintenance activities did not generate any dust

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OBJECTIVE	GOAL	MEASURE/HOW	ACHIEVED/NOT ACHIEVED	COMMENTS
<b>11.</b> To adequately protect cultural heritage sites and values during operations and maintenance	<b>11.1</b> To ensure that identified cultural sites are not disturbed	No impact to known sites. Any new sites identified are recorded in Land Management System and reported to appropriate authority.	Achieved	Operation and maintenance activities did not impact on any cultural sites.



**8.0 ANNEX B – PIPELINE CATHODIC PROTECTION DATA AND  
ON/OFF POTENTIALS PROFILES**

**ANNEX B**

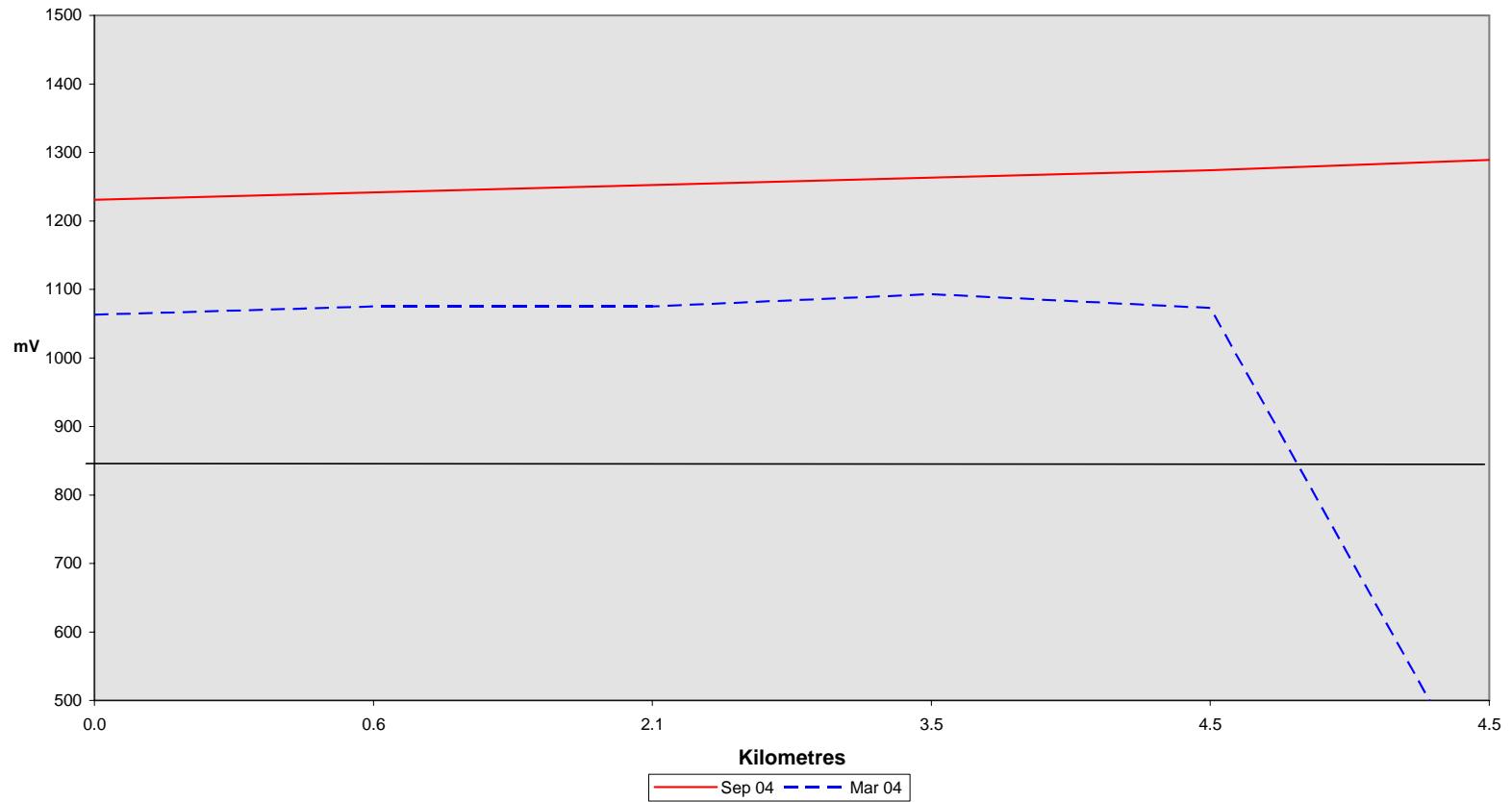
**CATHODIC PROTECTION DATA**

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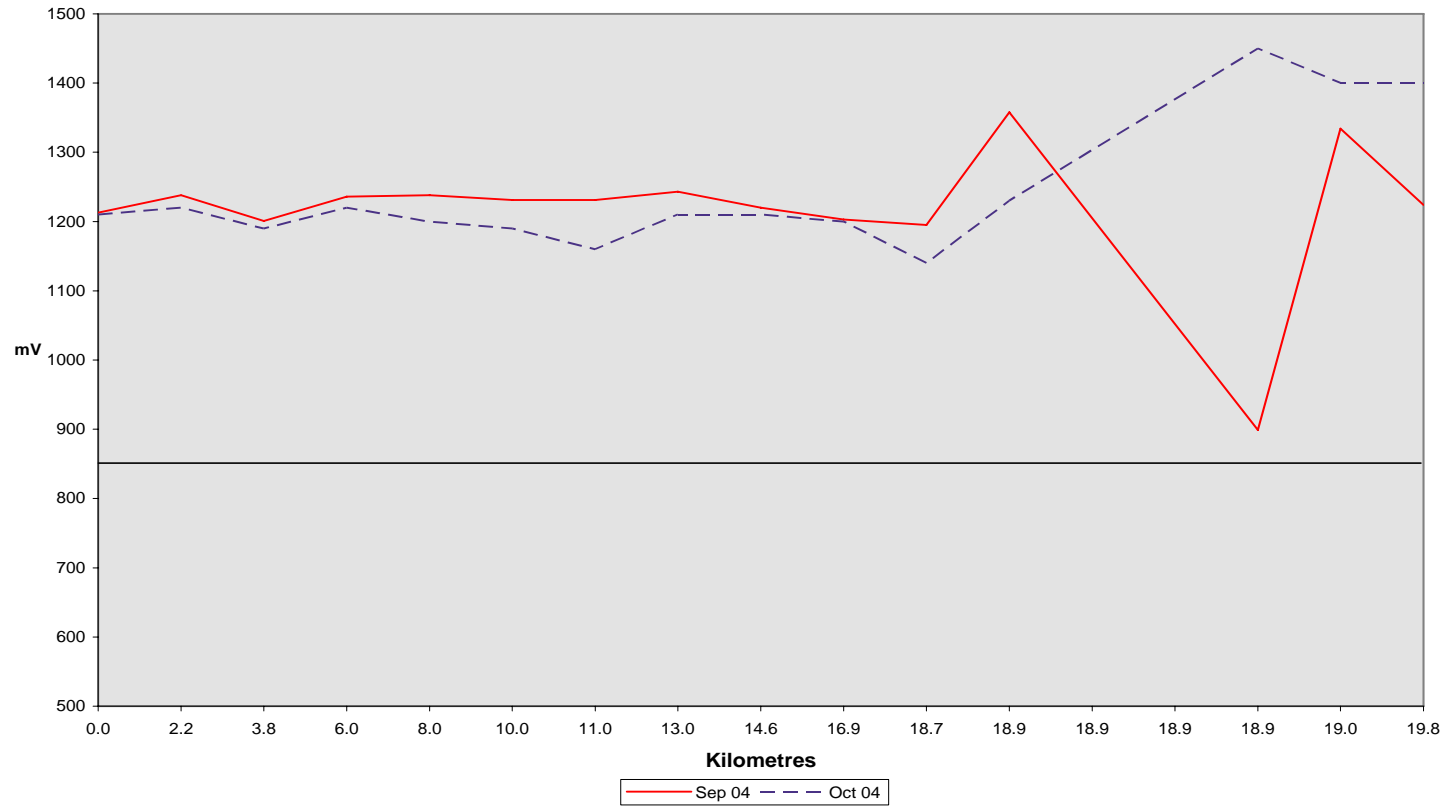
**DATED FEBRUARY 2005**

**PIPELINE CATHODIC PROTECTION DATA AND ON/OFF  
POTENTIALS PROFILES**

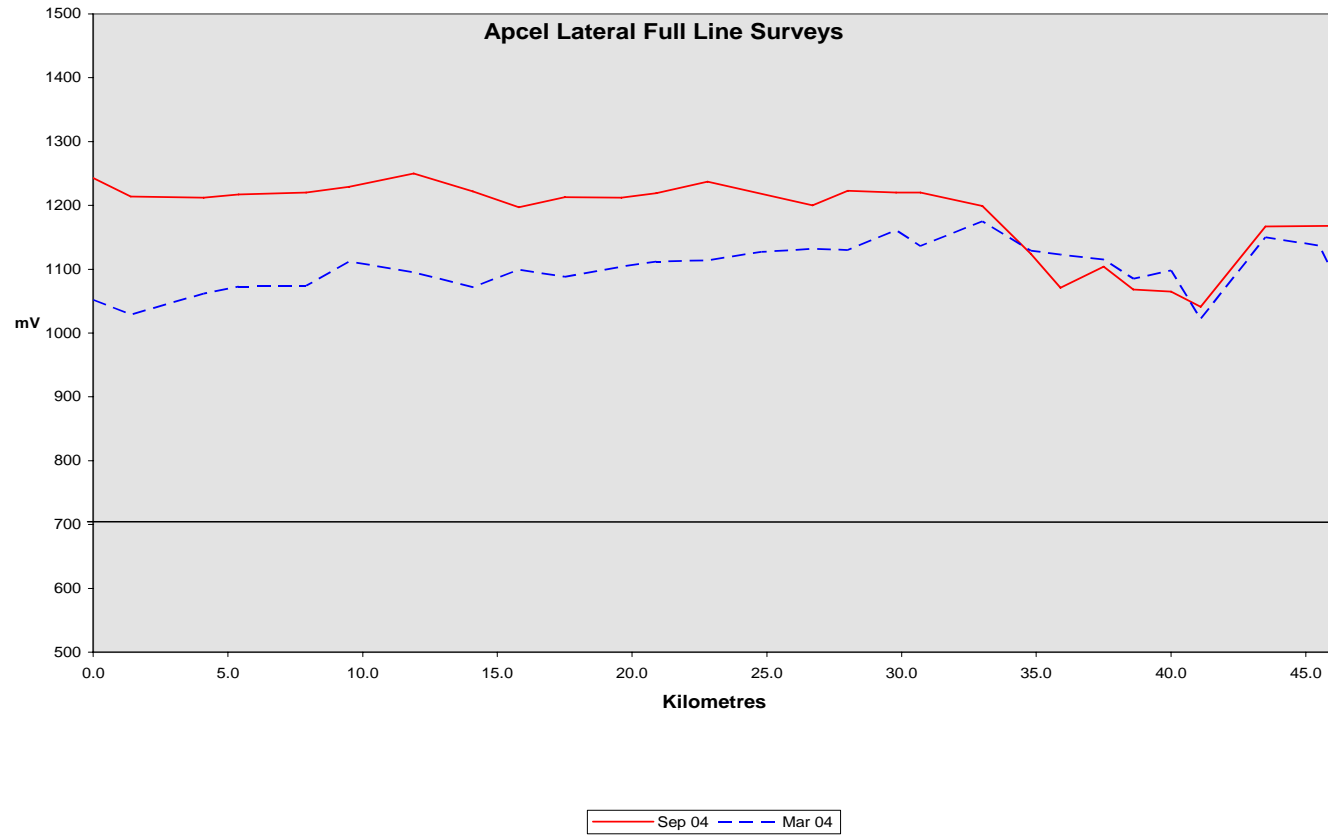
Safries Lateral Full Line Surveys



Mt. Gambier Lateral Full Line Surveys



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**9.0 ANNEX C – AC MITIGATION SURVEY**

**ANNEX C**

**A.C. MITIGATION SURVEY**

**2004 PL3/4 ANNUAL REPORT**

**DATED FEBRUARY 2005**

**2004 PL3&4 ANNUAL REPORT – SOUTH EAST PIPELINE SYSTEM  
AC Mitigation Survey**

on the

## **South East Pipeline**

Epic Energy requested this company to undertake an AC mitigation survey on your gas pipeline that flows from Katnook Gas Plant to Glencoe Junction and thence to Snuggery, and alternatively to Mt Gambier. This survey also covers AC mitigation to two spur lines, one from Katnook to the Safries Plant on the eastern side of the Penola to Nangwarry Road and from Kalangadoo to Nangwarry.

The investigations were undertaken in mid February this year and specifically we investigated the effects of high tension power lines AC induced voltages on the pipeline under normal load conditions, the effects of high tension power lines on the pipeline under current fault conditions, and the effects of lightning strikes on the pipeline. We also assessed and comment on the capability of the existing earthing ground beds to mitigation hazardous effects to satisfactory levels (Categories A and B) to protect personnel and third parties at the pipeline from the abovementioned conditions.

We refer particularly to the Australian Standard AS/NZS 4853 2000 *Electrical hazards to metallic pipelines*.

We identified the following key hazards.

### **High tension power lines (crossing)**

There are two distinct locations where high tension power lines cross the pipeline easements. In both instances, the high tension lines comprise three circuits. The power lines involved are the double circuit 275kV line (Tailem Bend - South East lines 1922 & 1923) and a single circuit 132kv line (Penola West - South East line 1864).

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1. **Katnook - Glencoe** pipeline at location 37° 28995! S -140° 45.1027' B, some 09km west of Krongart rail siding. The lines cross, at right angles.

Induced AC voltages on 100m parallel cable show induced AC of 0.734V whilst the pipeline test post revealed 0.06V AC signal, indicating good AC drainage from the pipeline.

Soil resistivity at the location is 4m - 540  $\Omega$ m, 3m – 1070 $\Omega$ m, 2m - 3340 $\Omega$ m, and 1m – 7190  $\Omega$ m. Distance from the closest towers to the pipeline is approximately 35m.

## **Conclusion**

We could see no physical evidence of mitigation procedures in place at this location, however, our readings taken along the pipeline itself led us to believe that this has been adequately allowed for in the design, and is effective (see Summary).

2. **Kalangadoo- Nangwarry** pipeline spur at location 37° 33.006' S - 140° 47.572 E on Seven Sisters Road 1.89km west of Nangwarry. At this point, the high tension lines cross the pipe at 90° and a parallel 33kV line (SD471) along the pipeline right of way goes underground at the crossing point. This 33kv line is discussed later in this report.

Induced AC voltages on 100m parallel cable show induced AC of 2.6V whilst the pipeline test post revealed 0.04V AC signal, indicating good AC drainage from the pipeline. The higher than expected induced voltage in the 100m test cable is probably due to the influence of the crossing 33kv line.

Soil resistivity at the location is 4m -43  $\Omega$ m. 3m - 105  $\Omega$ , 2m – 1050  $\Omega$ m, and 1m - 1900  $\Omega$ m. Distance from the closest towers to the pipeline is approximately 6m.

## **Conclusion**

There is evidence of an earthing anode in place and our readings tend to confirm this.

We believe that this has been adequately allowed for in the design, and is effective.

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**High tension power lines (parallels)**

Induced AC voltage from the parallel line south of Katnook.

There is some possibility of interference from a short parallel section of the PW-SE 1864 132kV power line south of the Penola West power station.

This single circuit 133kv line was installed some 5 years ago at which time Phil Cheesman from Cheesman & Associates undertook design of mitigation procedures on your pipeline which, to our knowledge, comprised the installation of a series of zinc anodes that were installed by Epic (Hans Borek).

There are no visible test posts for the monitoring of these zinc anodes, however, 100m induction tests along the pipeline route that we conducted showed less than 0.6mV AC induction.

Measurements of induced AC at the Katnook off-take and at the test point located at the crossing with the Boral Ladbrooke Grove pipeline show induced AC voltages of less than 008 V.

## **Conclusion**

We believe that any risk of induced voltage, earth fault voltage or lightning strike has been minimised and that the mitigation procedures are effective.

## **Low tension (33kV) power lines in parallel**



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There are two instances of a risk of induced hazard from parallel runs with a 33kv three- phase line.

1. **Glencoe - Tantanoola** road between 37° 40.969' S - 140° 34.555' E and 37° 40.571 S

-140° 28.033' B. with the ETSA S0481 33kV circuit, a distance of 9.8km.

Soil resistivity at the location is 4m - 500 Ωm, 3m - 412Ωm, 2m – 2020 Ωm, and 1m - 600 Ωm. Distance from the closest towers to the pipeline is approximately 6m.

Induced AC voltages on 100m parallel cable at several locations show induced AC of 1.5 - 4.1V. whilst the pipeline test post revealed 0. AC signal, indicating good AC drainage from the pipeline.

We could see evidence of mitigation measures taken along this route.

## **Conclusion**

We believe that any risk of induced voltage, earth fault voltage or lightning strike has been minimised and that the mitigation procedures are effective.

2. **Kalangadoo and Nangwarry** 37°33.349'S - 140° 44.535 E and 37° 32.932' S -140° 48.562 E with the ETSA SD471 33kv circuit, a distance of 6km. 2.5km of this distance is across open ground from Lowan Lane, the rest along Seven Sisters Road.

The area we investigated was along the right-of-way at Seven Sisters Road and extending further westwards with the EISA SD47 1 power line.

We could see evidence of mitigation measures taken along this route, and we measured on 100m induction line a maximum induced AC voltage of 0.1 7V and an induced voltage on the pipeline itself of 0.05mV AC.

Soil resistivity at the location is 4m -43 Ωm. 3m - 105 Ωm, 2m - 1050 Ωm, and 1m - 1900 Ωm. Distance from the closest towers to the pipeline is approximately 10m.

## **Conclusion**

We believe that any risk of induced voltage, earth fault voltage or lightning strike has been minimised and that the mitigation procedures are effective.

OTHER LOW TENSION POWER LINES

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There are a number of other low voltage power and SWER lines, either in proximity or crossing the pipeline(s), but we do not consider these pose a significant threat.

**Summary**

We are confident in the above cases that AC mitigation, earth fault and lightning control measures have taken place and are continuing to be effective. At the time of writing, we are not privy to the original construction plans so we can only assume that the sort of AC mitigation provided is via a series of earthing electrodes (zinc) sited along the pipeline.

Any induced voltages are remarkably low. It would appear that there is adequate mitigation, hence, we consider a low risk when taken in accordance with the parameters in the-Australian and New Zealand Standards.

The only unproven location is the HV crossing west of Krongart, however, we are reasonably confident that the mitigation has been addressed at this point though, in an absence of any prior design detail, this is an assumption. If required, we recommend that you look at the installation of 4 off 25kg zinc anodes direct coupled to the pipeline and radials located 1 2m from the pipe directly under the power lines.

Trusting this report is of assistance. Should you have any queries, please contact the undersigned.

**Mark Weston**

25 February 2004

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