

North Goonyefla Mine
Spontaneous Combustion Incident - Event Descriptors

63	2/1/98	5.00 PM	The TB was ordered from Blackwater by the Chief Mining Engineer	The TB took 24 hours to arrive and 12 hours to commission.
64	2/1/98	6.00 PM	Sealing of 9 c/t via borehole was completed	
65	2/1/98	8.00 PM	The water pump was turned on to pump into 5 cit borehole	<p>The pump operated for 11 hours at 28 l/s, 1.1 MI. Minor breakdowns occurred.</p> <p>The monitoring results showed CO and H, reduced at 5 c/t.</p> <p>3. Monitoring at 5 c/t was lost due to water in the tube and the integrity of the seals was threatened.</p> <p>4.</p>

North Goonyella Mine
Spontaneous Combustion Incident - Event Descriptors

66	2/1/98	9.00 PM	The Manager developed notification trigger levels in conjunction with the Consultant	<p>The ICM was advised of the action.</p> <p>These triggers were exceeded to around 1 1.00 PM and the Consultant returned to the mine. Hourly samples were initiated and the results returned rapidly to near fresh air status at 5 c/t.</p> <p>LW4 TG was monitored hourly in order to detect POC leaking if a seal had been breached.</p> <p>J. The results showed that a tube bundle blockage was diagnosed.</p>
67	3/1/98	AM	Bag samples were taken at 4, 5 and 7 c/t, water coming out	<p>The water which was introduced at 5 c/t had built up behind 5 c/t seal and was ensuing from the sample pipe when opened. Water was leaking abundantly around the periphery of 6 c/t seal.</p>
67A		8.15-9.15 AM	The second batch of CO ₂ was started	<p>Having noted a reduction in O₂ content accompanied by a reduction H₂ and CO at 5 c/t when the initial batch of CO₂ was introduced, decanting of the second batch was implemented.</p> <p>This was intended to cool the heating, deplete oxygen and allow access to the mine and re-establish the 5 c/t monitoring point.</p> <p>3. 3,000 l of CO₂ were introduced producing 1,500 m³ of gas.</p> <p>4. This resulted in a reduction in O₂ concentration at 5 c/t seal to 9% from 15-18% and an increase in CO₂ to 57%.</p>
68	3/1/98	1 1.15 AM	The Manager returned underground to check the water pressure behind 6 c/t (2 psi)	<p>The MM and Undermanager measured water pressure at 6 c/t through sample pipe. The pressure was 2 psi, indicating at that stage that the water pressure was approximately 1.5m.</p> <p>2. The 5 c/t sample tube was <u>now clear, having been water filled</u> earlier.</p>
68A	3/1/98	1 1.15 AM	Bag samples were taken to Moranbah North for comparison readings	<p>The GC at Moranbah North was used to check the results obtained at North Goonyella since critical decisions were being made, based essentially on GC data.</p>

rk\Nth Goonyella \

69	3/1/98	10.00 AM - 2.30 PM	There was a phone conference with the Incident Management Team, CMI and SIMTARS	<p>A discussion was held to update the CMI and SIMTARS chemists on the situation.</p> <p>The CMI again advised consideration of ventilation changes to the system. The Incident Team did not elect to exercise this option.</p>
----	--------	--------------------	---	---

North Goonyella Mine
Spontaneous Combustion Incident - Event Descriptors

70			The TB arrived at 1 1.00 AM	<p>Problems were encountered in gaining access to the TB at Cook Colliery and also with parts being left behind at Cook.</p> <p>2. Craning was a problem in that cranes and drivers had to be organised once the TB arrived on site, rather than being organised prior to that event.</p> <p>J. The authorisation of crane drivers was an issue in that some of the North Goonyella staff are authorised as crane drivers but this resource was not used.</p>
70A			The Manager, Undermanager, Surveyor, and Consultant went underground to reestablish a tube bundle sampling point at 5 c/t	<p>After the introduction of water at 5 c/t, the tube bundle line had become blocked by water.</p> <p>2. Having introduced 1,500 m of CO₂ at 5 c/t there was evidenced that the area was blanketed by CO₂ and was therefore depleted of oxygen.</p> <p>3. The decision was taken with the agreement of the ICM and DCI to send a team to repair the tube bundle system in order to re-establish monitoring at the key point.</p>
71			The TB was commissioned	<p>The TB was commissioned at midnight, ran for 1.5 hours and then stopped. The TB re-started in earliest at 5.00 AM. The TB was connected to the 5 c/t borehole which was 4" diameter rather than the normal 6".</p> <p>2. The second inerting hole at 4 c/t was completed and the decision made to continue at 5 c/t rather than move the TB as the monitoring results were favorable.</p> <p>J. Pipes were laid out such that the TB could be connected to the 4 c/t borehole without moving the TB, or both holes could be placed on line in parallel.</p> <p>4. The O₂ concentration at 5 c/t reduced to approximately 4.5% within 7 hours. Over the next 36 hours it reduced to 0.5% but stabilised at approximately 2.5% following adjustment of the TB fuel system.</p> <p>5.</p>

North Goonyefla Mine
Spontaneous Combustion Incident - Event Descriptors

72	3/1/98	6.00 AM - 12.00 PM	The surface borehole at LW3 MG was aborted due to difficulties, started drilling at 4 c/t	<p>A surface borehole was being drilled at LW3 2.5 c/t for the purpose of sealing behind LW3 1-4 chocks and reducing leakage to the area of the heating.</p> <p>2. This hole was also a back up inerting hole.</p> <p>J. At this stage, the need to seal at LW3 MG was reduced as the inerting at 5 c/t borehole was taking effect, evidenced by the EMS data (ref. graphs). Difficult drilling and reduced requirement led to the decision to abandon and drill a back up inerting hole at 4 c/t.</p> <p>4. The 4 c/t hole was part of the strategy and this decision represented deletion of an element no longer required.</p> <p>5. The difficulty in drilling into goaf at this point accelerated the decision.</p>
72A	3/1/98	6.00 AM - 12.00 PM	There was observed a dramatic reduction in O ₂ , 1-12 CO readings at 5 c/t seal	<p>Following introduction of CO₂ at 5 c/t borehole the readings of O₂, 1-12 and CO at 5 c/t sampling point showed large scale reductions, indicated by the EMS graphs.</p> <p>2. Similar reductions were not seen at 7 c/t until later.</p>
73	4/1/98	8.00 AM	There was an Incident Management meeting - action plan	<p>Remedial work to get back underground i.e. grouting of LW3 MG area. Repair tube bundles at 4 and 7 c/t. Stone dusting LW3 and LW4 TG. Based on zero 1-12 reading.</p>
74	4/1/98	8.30 AM	The decision was taken to conduct one hourly sampling at 5 c/t	<p>This was decided in order to establish trends resulting from inertisation.</p>

Goonyella

75	4/1/98	11.20 AM - 1.40 PM	The Manager, 2 Undermanagers, Mines Rescue Officer and Miners Officer went underground	<p>3. Bag samples were taken from 3, 4, 5 and 7 c/t.</p> <p>4. The 5 and 6 c/t seals were repaired. The pressure drop across seals was measured The pressure drops were as follows: 3 c/t = 135 Pa 4 c/t = 135 Pa 5 c/t = 160 Pa 7 c/t = 80 Pa.</p>
	4/1/98	5.30 PM	BHP Moura were contacted regarding a spare TB	<p>BHP was placed on standby in case of a problem with the TB.</p>

North Goonyefla Mine
Spontaneous Combustion Incident - Event Descriptors

77	4/1/98	5.30-8.30 PM	Level was declared by the Manager	Based on interpretation of monitoring data, the decision was made to commence the return to normal operations.
----	--------	-----------------	--------------------------------------	--

rk\Nth

North Goonyella Mine

Spontaneous Incident - Event Descriptors
CO₂ Inburstion

78	4/1/98	5.30 PM	The Manager established triggers for notification to the Manager and Ventilation Engineer	2. The trigger levels were established according to the SCHMP, 100 ppm Hi, > 200 ppm CO; >7% O ₂ . If triggers were reached, then hourly sampling would be implemented. If two consecutive samples of greater than 200 ppm H ₂ , 400 ppm CO and 9% O ₂ were recorded, then the mine would be evacuated.
79	4/1/98	8.57 PM	The TB stopped at 8.57 - 9.15 and again at 9.42 - 10.56 PM	The stoppage was caused by a dirty fuel filter. O ₂ at 5 c/t seal increased from 3.5% to 5.5% by 10.00 PM. Issues were raised relating to: Maintenance Spare parts Technical back-up Analysis of gas produced by the TB.
80	5/1/98	12.00 AM	The ICM and the Consultant checked the method of GC use	The SIMTARS operator was having difficulty. A second trained operator was recalled to duty. 3. Training of operators of GC was again raised as an issue.

rk\Nlh\oonvelk,

k__J

Descriptors

	5/1/98	8.00 AM - 12.30 PM	The DCI, Senior Mines Inspector (SMK), the ICM and the Manager conducted an inspection of the mine	2. This preceded the normal pre-shift inspection by Deputies. Meetings were held between the mine management, Incident Team and Inspectorate following the inspection.
82	5/1/98	8.30-11.30 PM	The Deputies pre-shift inspections were conducted	The inspections were suspended due to trigger levels being reached and the mine was evacuated.
83	5/1/98	11.30 PM	The Deputies were withdrawn from the mine	A linear increase in CO and H ₂ at 5 c/t was observed and considered to be inexplicable. CO and H ₂ reached 700 ppm and 400 ppm respectively.

rk\Nlh

North Goonyella Mine
kYSpontaneous Combustion Incident - Event

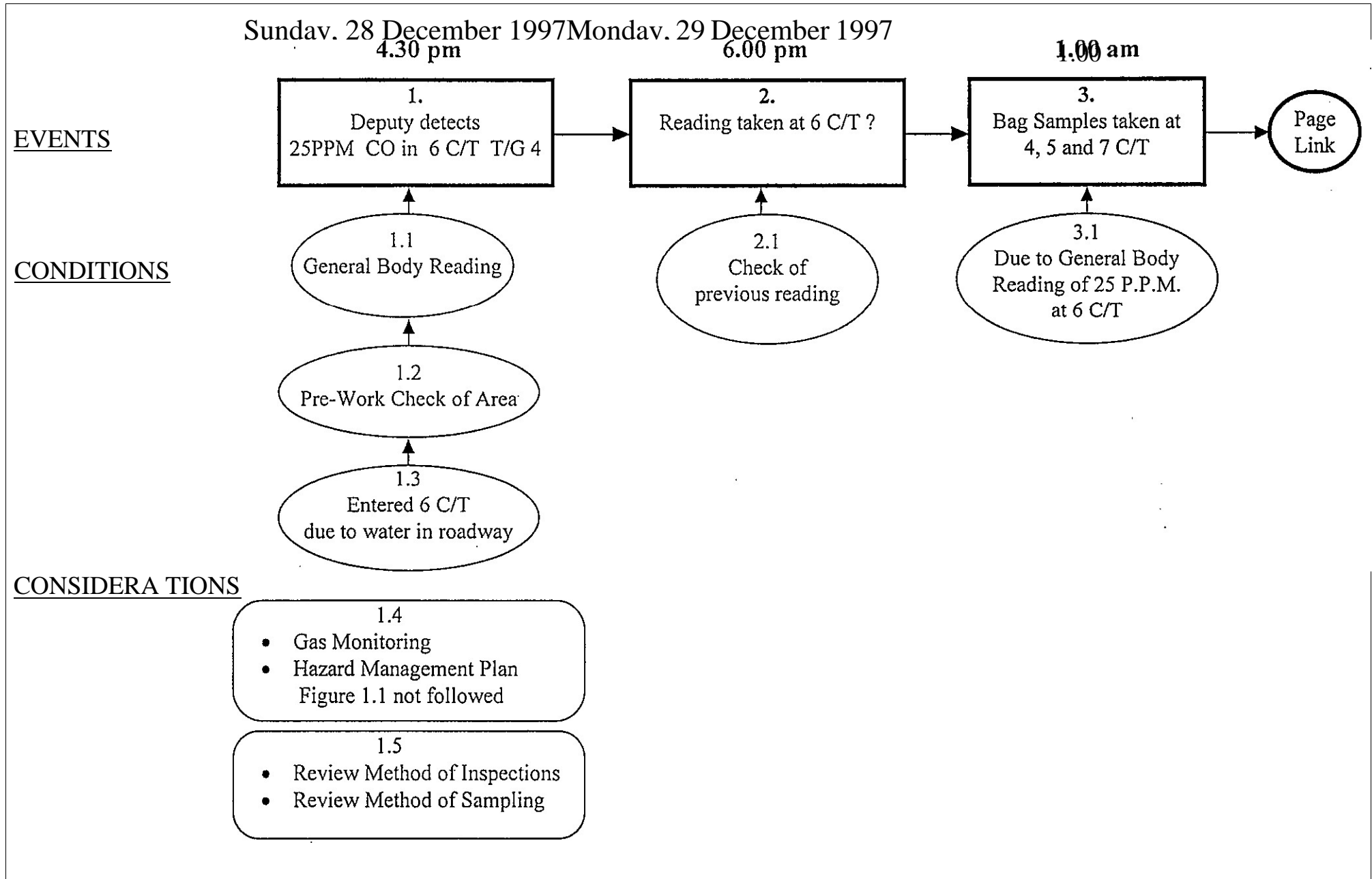
Descripn,-
cs

84	6/1/98	3.00 AM	The TB was suspected to be the cause of reaching trigger levels	<p>The Consultant asked for a bag sample of the TB exhaust due to the unusual linear trend in CO and H2 at 5 c/t.</p> <p>Bag samples were taken from the exhaust of the TB. The result showed 1,300 H, and 2,200 CO.</p> <p>2. Routine hourly analysis of the TB exhaust was instigated.</p> <p>Subsequently, the TB was proven to be very sensitive to fuel pressure, incomplete combustion occurring at high pressure, causing the appearance of CO and 1-12 in the exhaust.</p> <p>4. The TB had been operating at 0.5% O2, 20 ppm CO. At 10 AM, the TB was observed to produce 0.5% O2 and 150 ppm CO. At that output, 1-12 was also present. A compromise was agreed where the TB output was 1.2% O2, 20 ppm CO and zero FL.</p> <p>5. The TB operators were instructed to monitor the output and report to the Incident Team if O2 or CO moved from the agreed value $\pm 5\%$.</p> <p>6.</p>
85	6/1/98	4.15 AM	The TB was shut down on overtemperature	<p>Moths blocking the condenser were believed to be cause.</p> <p>Once the TB stopped the 1-12 and CO concentrations at 5 c/t began to decline.</p>
86	6/1/98	8.00 AM	The Deputies pre-shift inspection was conducted	<p>The men went underground at 10.30 AM.</p> <p>A normal shift was worked.</p> <p>3. Three hourly bag samples from 4, 5 and 7 c/t were resumed from one hourly, due to falling below the set trigger levels.</p>

rk\Nth

GLOSSARY

ACMI	Acting Chief Mines Inspector
adsorbed	The process of gas entrapment in the pore matrix of coal
CFMEU	Construction, Forestry, Mining & Energy Union
CH ₄	Methane
CMI	Chief Mines Inspector
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
c/t	Cut through
DAK	Loudhailer communications system
DCI	District Check Inspector
desorbed	The process of gas release from the pore matrix of coal
DMM	Deputy Mine Manager
EMS	Environmental Monitoring System
GC	Gas Chromatograph
GM	General Manager
GMHMP	Gas Monitoring Hazard Management Plan
l-12	Hydrogen
V _s •	litres per second
LW	Longwall
m	metres
MG	main gate
MI	Megalitres millimetres
MM	Mine Manager
O ₂	Oxygen
Passport	Hand Held Monitoring Device
PED	Personal Emergency Device
PJB	personnel transport
POC	products of combustion
ppm	parts per million
QMRS	Queensland Mines Rescue Service
SCHMP	Spontaneous Combustion Hazard Management Plan
SIMTARS	Safety in Mines Testing and Research Station
SMI	Senior Mines Inspector
SMRS	Southern Mine Rescue Service



NORTH GOONYELLA -

GOAF SPONTANEOUS HEATING, December 1997

Monday
29 December 1997

EVENTS

Page Link

4.00 pm
4. Analysis of Bag Sample
HIGH CO and H²

4.45 pm
5. Gas sample results reported to Manager

5.00 pm
5a. Officials to re-sample 5 and 7 C/T

5.55 pm
6. Manager Ordered Withdrawal of Men from Mine

6a. SIMTARS placed on standby to check/analysis results

Page Link

Page Link

CONDITIONS

4.1 Bag Sample taken due to 25 P.P.M.

5.1 Reported by Ventilation Engineer due to HIGH CO and H²

6.1 Sample result raised concern

6.2 In excess of Trigger Levels in Plan

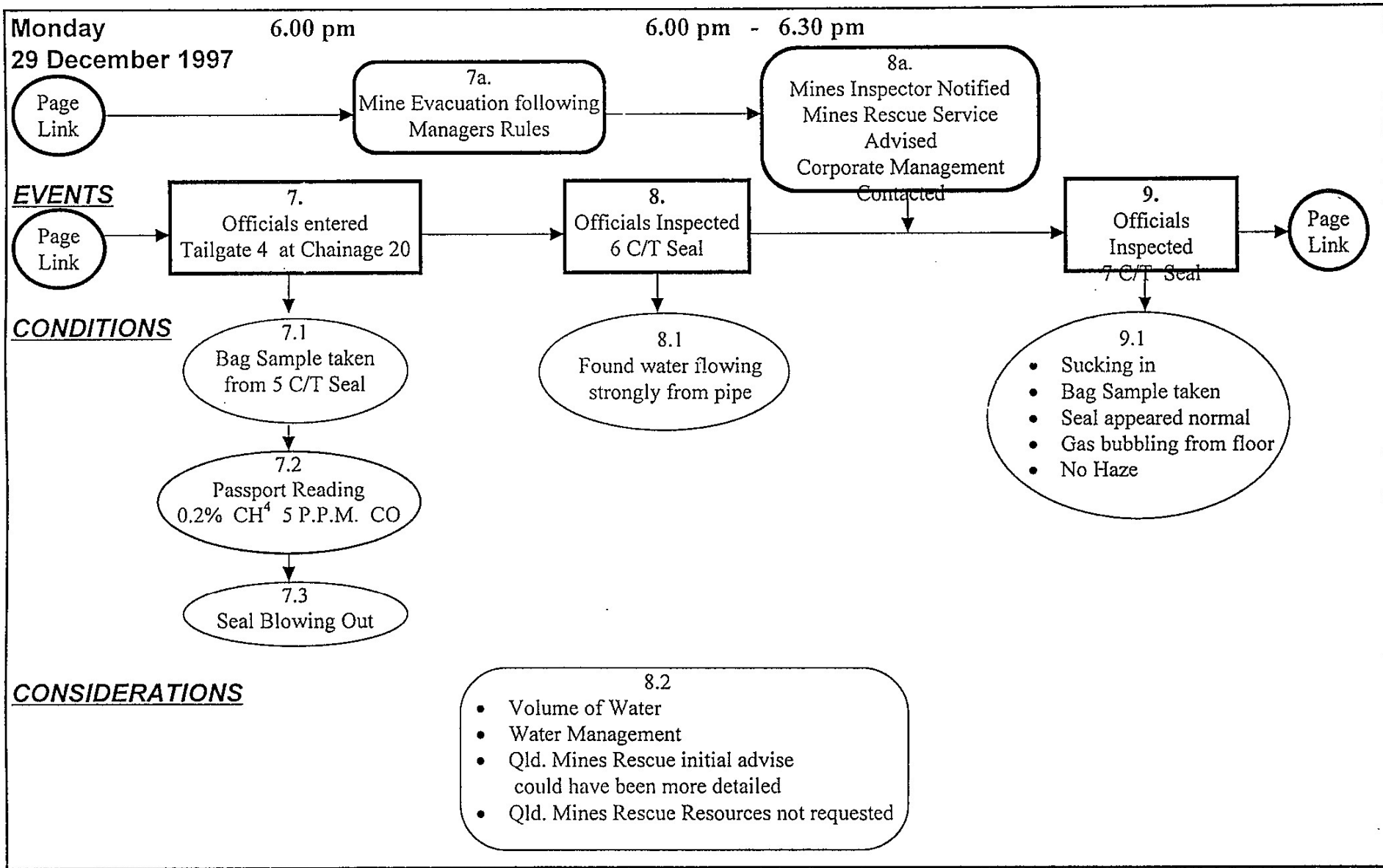
6.3 Abnormal for Nth. Goonyella

CONSIDERATIONS

- 4.2
- Delay in Testing Sample
 - Inconsistent with Requirement of Gas Management Plan
 - Lack of Urgency
 - Lack of Resources

- + 6.4
- Managers Rules Required Action
 - Need for Action Recognised
 - Action Exceeded Plan Requirement
 - Decision to Act Correct
 - Significant Event / Action

- 6.5
- Was Plan Appropriate ?
 - Emergency Evacuation Muster Area
 - Lamp Room Location
 - Ambulance Room Location



Monday

29

8.00 pm - 8.15 pm

EVENTS

Page Link

10.
Officials arrived
LW 4 Tailgate sampled
from rear 146 chock

11a.
I.C.M. informed Acting C.I.M.
of Initial Bag Sample Results

12a.
Miners Officer contacted
D.C.I. re approval to go
underground

Page Link

11.
Information Session
with Workforce by
Mine Manager

12.
Manager requested
Volunteers to
Inspect Seals

Page Link

CONDITIONS

10.1
2.4% CH⁴
120 P.P.M. CO
< 16% O²

11.1
Due to withdrawal
Explanation of situation
potential hazard

12.1
Rejected
by Workforce

December 1997

11.2
• Trigger Levels for
Strategic Withdrawal
• Review Steps / Stages

12.2
Logic ?

CONSIDERATIONS

Monday
29 December 1997

10.25 pm

10.30 pm

Page
Link

13a.
Manager contacted I.C.M.
with 2nd lot of results
(10.00pm)

13b.
D.C.I. contacted I.C.M.
re. concerns about any men
underground

13c.
I.C.M. contacted Acting C.I.M.
about general concerns
but specifically men underground

Page
Link

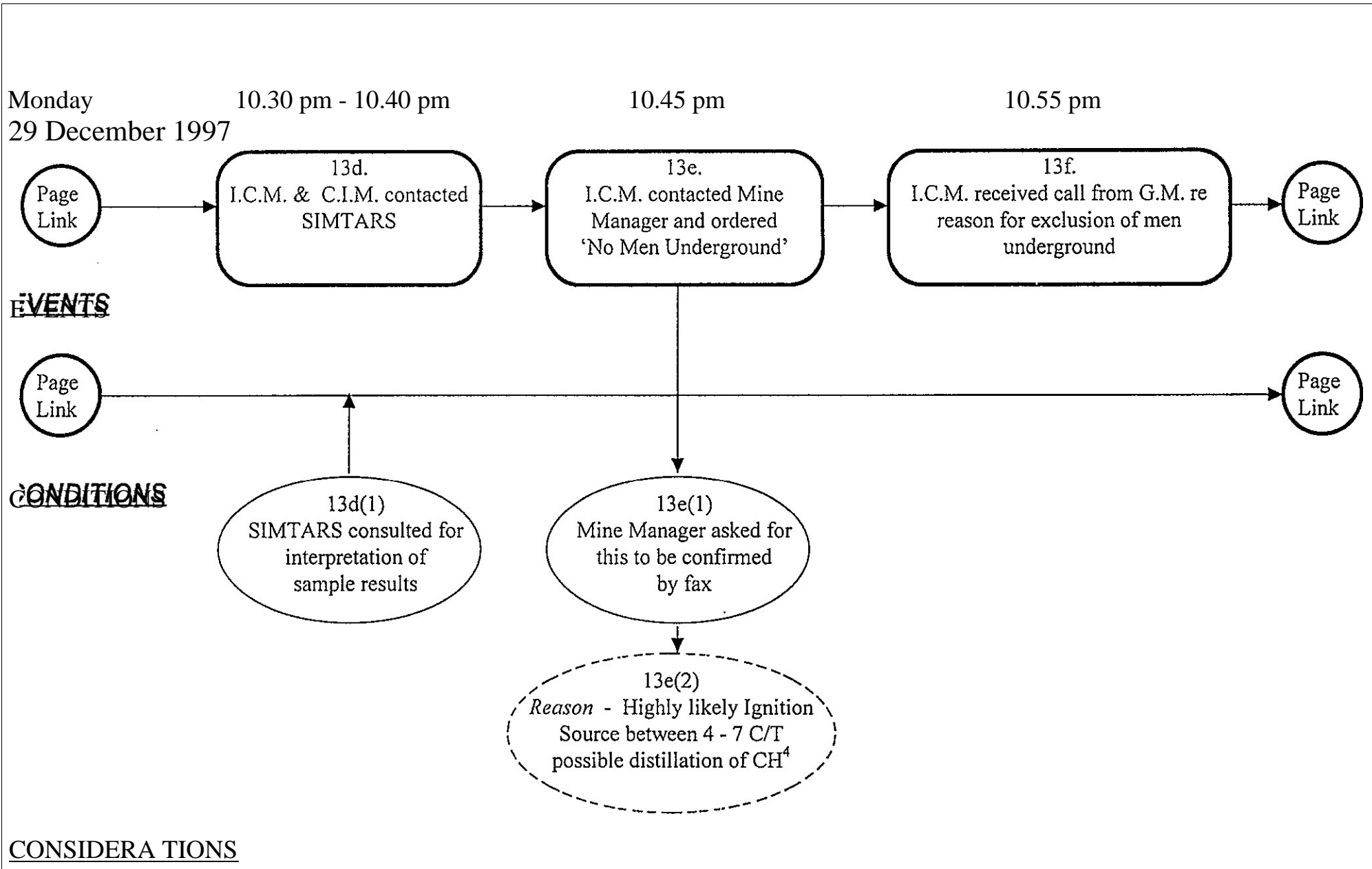
13.
Discussions taking
place onsite

EVENTS

LinkLink

CONDITIONS

CONSIDERATIONS



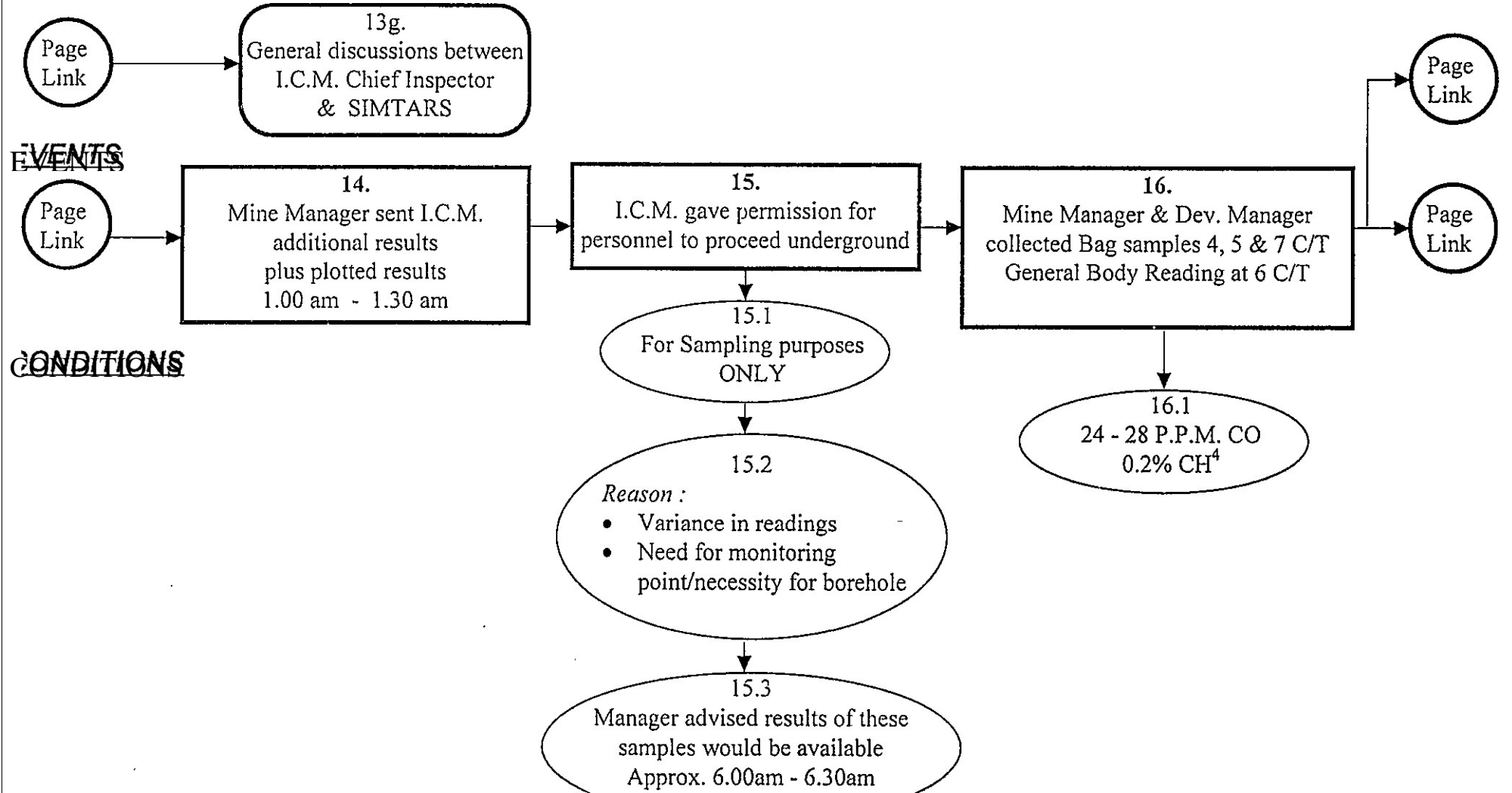
NORTH GOONYELLA - LW3 GOAF SPONTANEOUS HEATING, December 1997

Tuesday
30 December 1997

12.05am - 3.00 am

3.30 am

4.00 am



NORTH GOONYELLA - LW3 GOAF SPONTANEOUS HEATING, December 1997

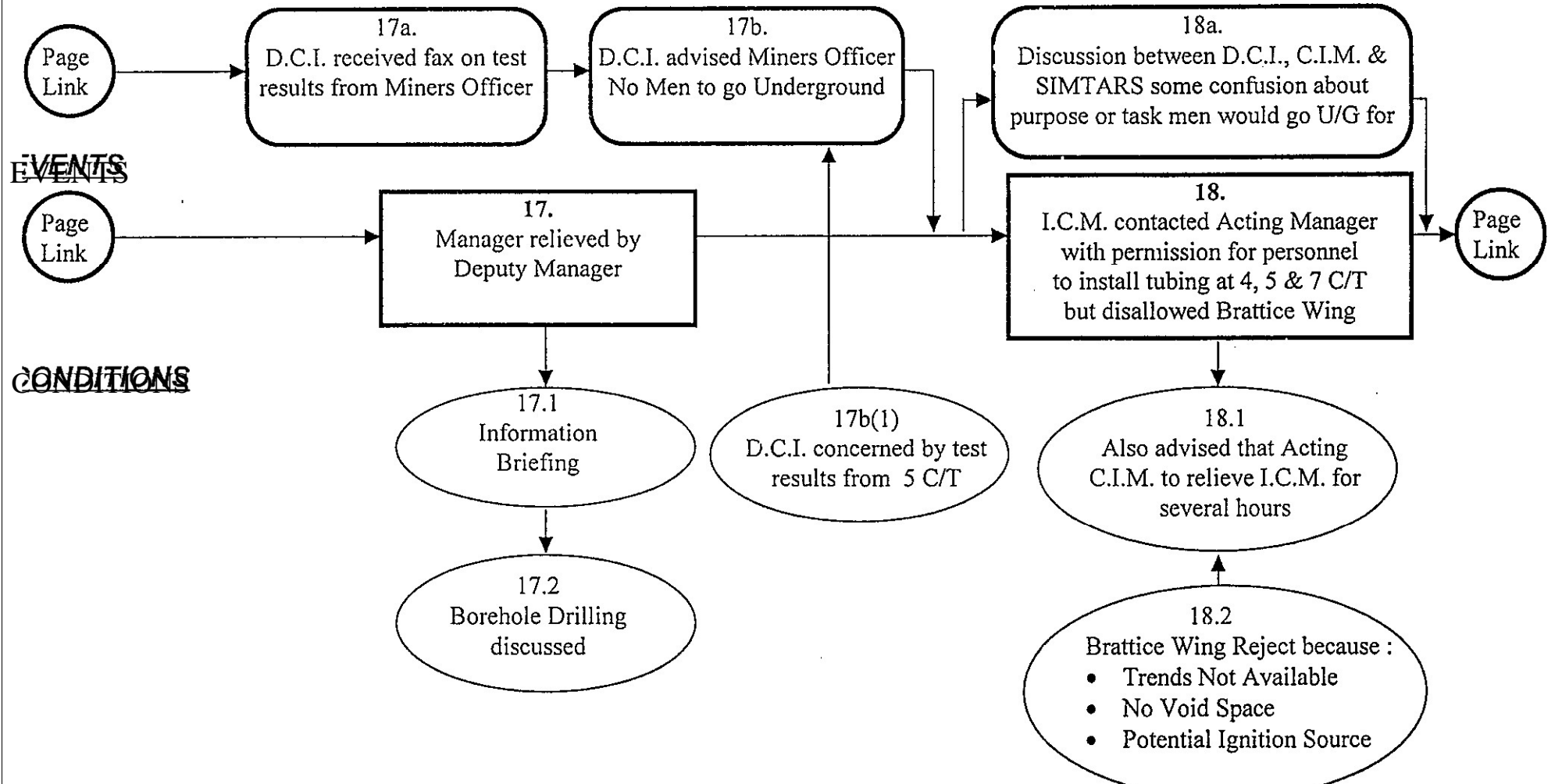
CONSIDERATIONS

Tuesday
30 December 1997

6.00 am

7.00 am

7.50 am



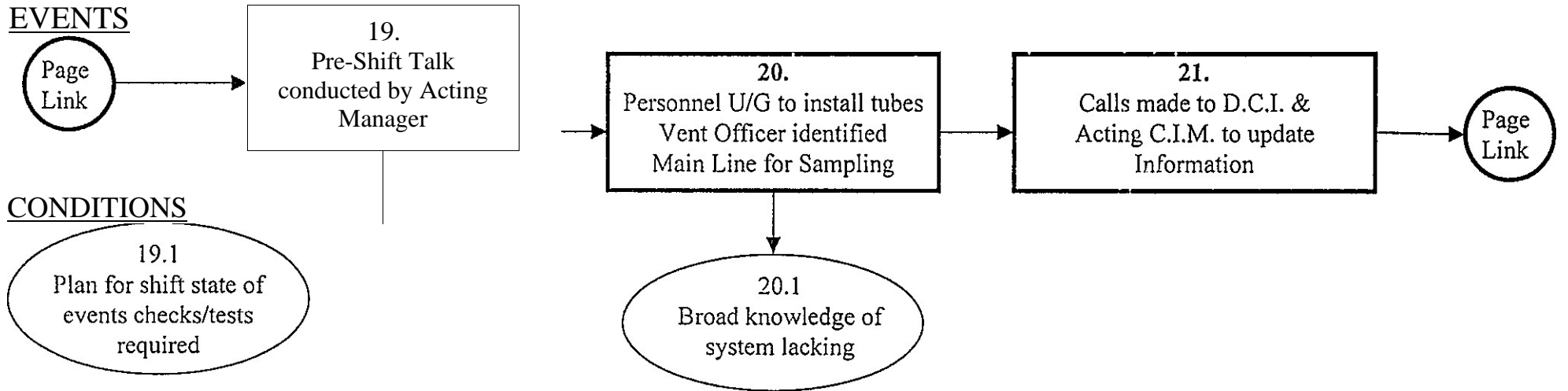
NORTH GOONYELLA - LW3 GOAF SPONTANEOUS HEATING, December 1997

CONSIDERATIONS

Tuesday
30 December 1997

8.00 am

EVENTS



CONDITIONS

19.1
Plan for shift state of
events checks/tests
required

20.1
Broad knowledge of
system lacking

CONSIDERATIONS

Identification/Coding of Tube
Bundle Lines

NORTH GOONYELLA - LW3 GOAF SPONTANEOUS HEATING, December 1997

rkbühgoonUw3e&cch.doc

Installation

Local knowledge of System/Layout
Events & Conditions Charting

Methods

NORTH GOONYELLA - LW3 GOAF SPONTANEOUS HEATING, December 1997

Tuesday
30 December 1997

EVENTS

Page
Link

10.30 am
22.
U/G Official called (by phone) to advise 4 C/T seal connected
Acting Manager requested checks be done for general signs of Spontaneous Combustion

10.30 am - 11.30 am
23.
Fax arrived from D.C.I. re No Men Underground

10.30 am - 11.30 am
24.
Acting Manager advised Acting C.I.M. of fax from D.C.I. & requested Acting C.I.M. to override the Order

Page
Link

CONDITIONS

23.1
Section 76 & 76A

23.2
Made recommendation to do Borehole & consider Inertisation

CONSIDERATIONS

22.1
• Emergency Communications System

24.1
• Early Onsite Involvement of

NORTH GOONYELLA - LW3 GOAF SPONTANEOUS HEATING, December 1997

rkIn1hgoonUw3e&cch.doc

Extended Emergencies
Lists of Available Resources

Events & Conditions Charting

Incident Team

Page 10

NORTH GOONYELLA - LW3 GOAF SPONTANEOUS HEATING, December 1997

Tuesday
30 December 1997

EVENTS

Page Link

11.30 am

25.
I.C.M. advised Acting C.I.M.
he was back on duty

12.00 Midday

26.
E.M.S. indicated increase in
CO reading from L/W 4
Tailgate

12.30 pm

27.
Extra Tube sent U/G
Personnel advised material
to be left at doors

Page Link

CONDITIONS

25.1
Discussed D.C.I. Sect. 76 Order
I.C.M. sent fax to Acting
Manager overriding the Order

26.1
5.3 P.P.M.

26.2
Reason : Believed due to
Diesel Vehicle Operation in
Panel

NORTH GOONYELLA -

GOAF SPONTANEOUS HEATING, December 1997

rk\nt\ngoonyella\hw3e&cch.doc

d:

CONSIDERATIONS

Tuesday
30 December 1997

12.30 pm

12.45 pm

12.45 pm

NORTH GOONYELLA - LW3 GOAF SPONTANEOUS HEATING, December 1997

CONSIDERATIONS

EVENTS

Page
Link

28.
E.M.S. indicated 33 P.P.M. at
L/W 4 Tailgate 1 C/T

29.
Call from I.C.M. requesting
Personnel Out of Mine
by 2.00 pm

30.
Started to mobilise
Drill Rig

Page
Link

CONDITIONS

28.1
33 P.P.M. CO

29.1
Concern due to
barometer pressure drop

28.2
Believed to be caused by
system interruption -
Due to additional sample points -
System adj. & flushing

CONSIDERATIONS

NORTH GOONYELLA - LW3 GOAF SPONTANEOUS HEATING, December 1997

28.3
Supported by checking sample flows through CO analyser - Off-scale due to seal sampling through tubes.
Time for analyser to restablise

Tuesday
30 December 1997

12.45 pm

12.50 pm

31.
Acting Manager asked Mining Engineer to collect Information Inertising Goaf

32.
Message sent to Personnel U/G on P.E.D.

33.
Acting Manager notified I.C.M. & Corporate Executive of CO reading in L/W 4 Tailgate

Page Link

EVENTS

CONDITIONS

32.1

- Out of Mine by 2.00pm
- Check CO reading in Tailgate 4

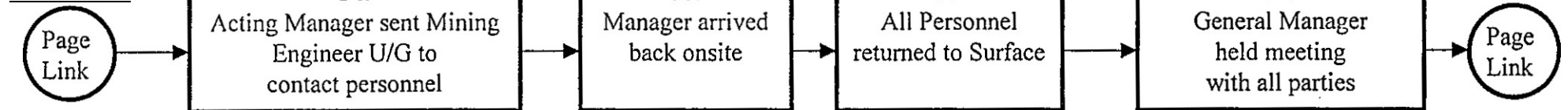
33.1
33 P.P.M.

33.2
Reason Not Known

CONSIDERATIONS

Tuesday
30 December 1997

EVENTS



CONDITIONS

