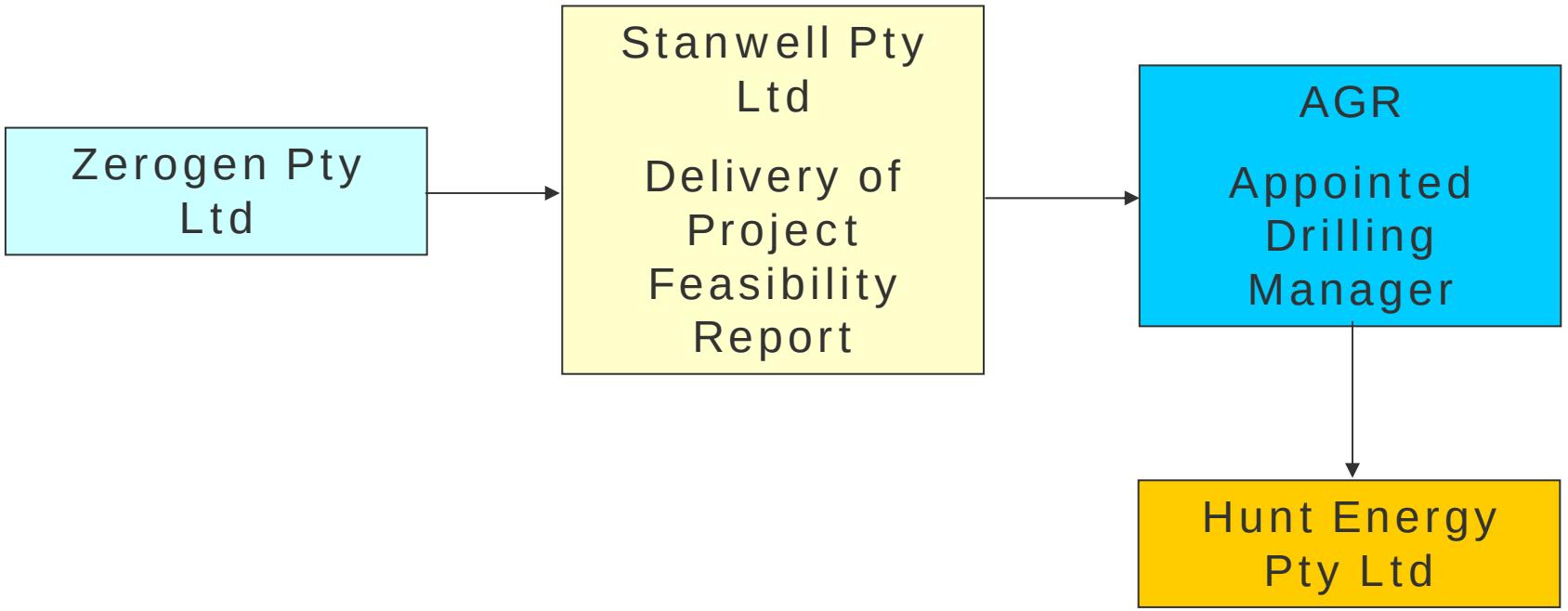
Dropped Blocks
Near Miss Incident Investigation
Amy Hodson

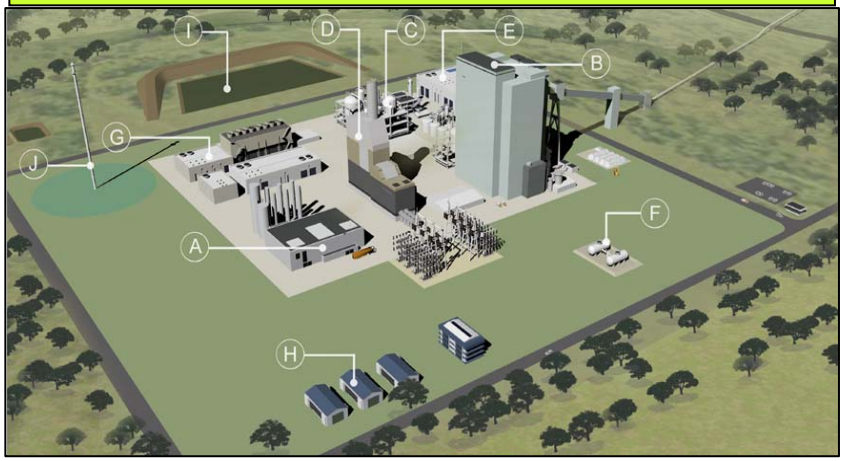
Drilling Programme Organisational Structure



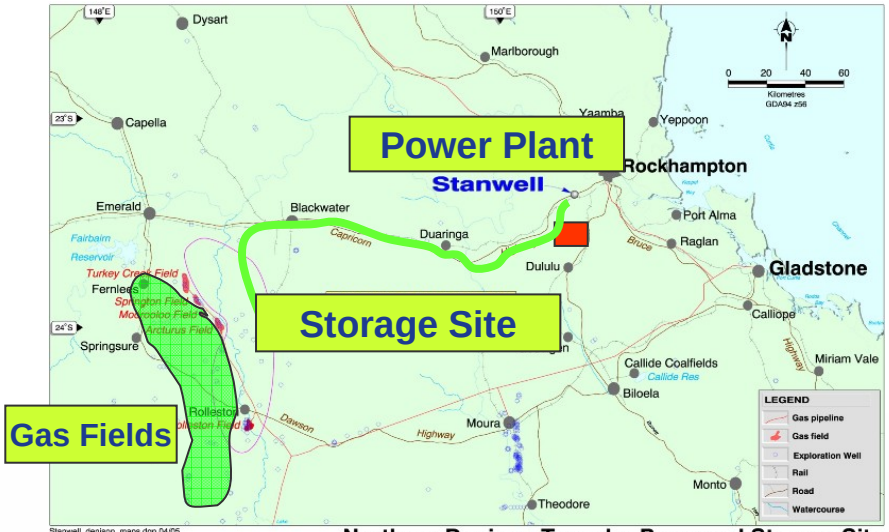
ZeroGen Project

ZeroGen
smarter, cleaner power

Gasification Power Plant Rockhampton



~220 km Pipeline



Northern Denison Trough - Proposed Storage Site

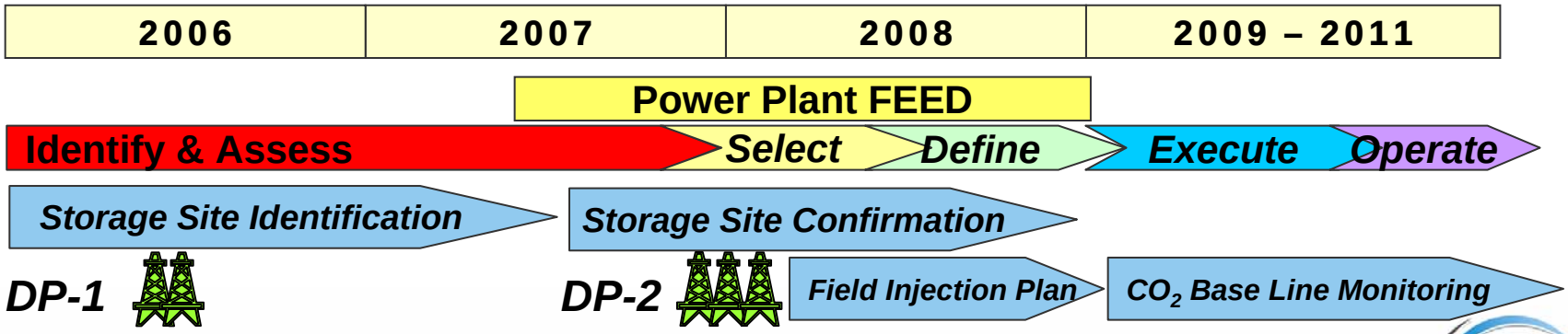
ZeroGen PROGRESS

- ✓ FEASIBILITY STUDY
- ✓ EIS COMMENCED
- ✓ PIPELINE ROUTE AQUISITION
- ✓ DRILLING PROGRAM
- ✓ EXTENSIVE CONSULTATION
- ✓ FRONT END ENGINEERING

What is ZeroGen's CSS Program

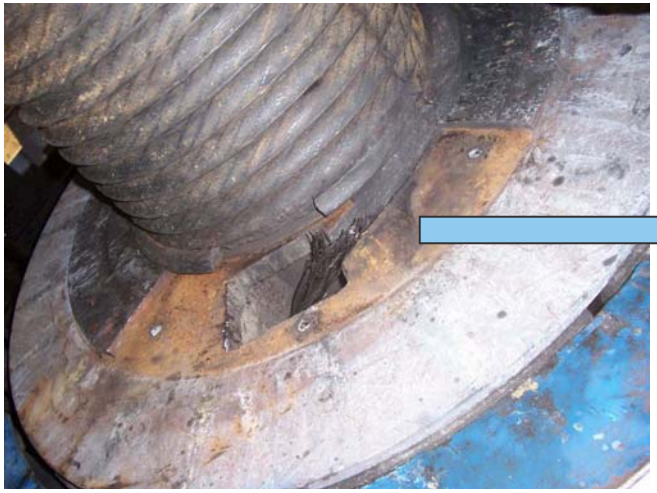
Drilling Program 2 (DP2) 2007/08 - "Site Verification"

- Data acquisition to:
  - Reduce subsurface uncertainties to acceptable level
  - Quantify storage & injection potential
  - Optimise the storage implementation plan
  - Test monitoring and verification technology



Near Miss Incident Description

- **Where:** Hunt Rig 3, Arcturus Downs, Springsure, QLD
- **When:** 5th June 2006
- **What:** Dropped Blocks onto Rig Floor
- **Significance:** Potential fatality or serious injury if someone had been struck by falling block or wire.
- **Investigation Team:** Phil Harrick and Andy Urdevics



What Happened….

- Bridle lines had been hung and unhooked and activity proceeded to lowing the blocks to the floor.
- At the top of the A-legs Driller heard a loud noise and noticed the drill line leaving the drum at a rapid pace.
- Driller realised there was no way of pulling the blocks up and ducked for cover, yelled to “get out of there” and ran into the dog house.
- Driller and two other hands that were working in the doghouse, left the floor at the earliest safe moment.

What could have happened.....

Two crew members working in dog house

Driller standing at control panel

Dropped blocks

Sequence of Events

Date	Time	Event
27-28/5/06		Drill line spooled in the blocks and derrick
30/5/06		Drill line was installed on the deadline anchor
4/6/06		Drill line was spooled on to the draw works drum
5/6/06	am	Mast Raised into position
5/6/06	1400 hrs	New Drilling Crew comes on shift to assist existing shift
5/6/06	1400 -1500 hrs	Hanging of bridle lines and other rig up activities. Toolpusher involved in visitor and other 3rd party site inductions
5/6/06	1500 hrs	Discussion between Driller 1 and 2 on activities to be carried out
5/6/06	~1505 hrs	Driller 1 goes for smoke
5/6/06	~1505~1510	Driller 2 instructs two derrickmen to put on harnesses in preparation for ascending derrick to loosen standpipe clamps
5/6/06	1510	Driller 2 instructs Motorman to put swivel on catwalk to be lifted to rig floor
5/6/06	1515	Driller 2 begins to lower blocks to allow swivel to be attached
5/6/06	1518	Drill line parts from drawworks drum and blocks fall to rig floor from ~ 20 feet.
5/6/06	~1520	Crew mustered, incident scene made safe, investigation started.

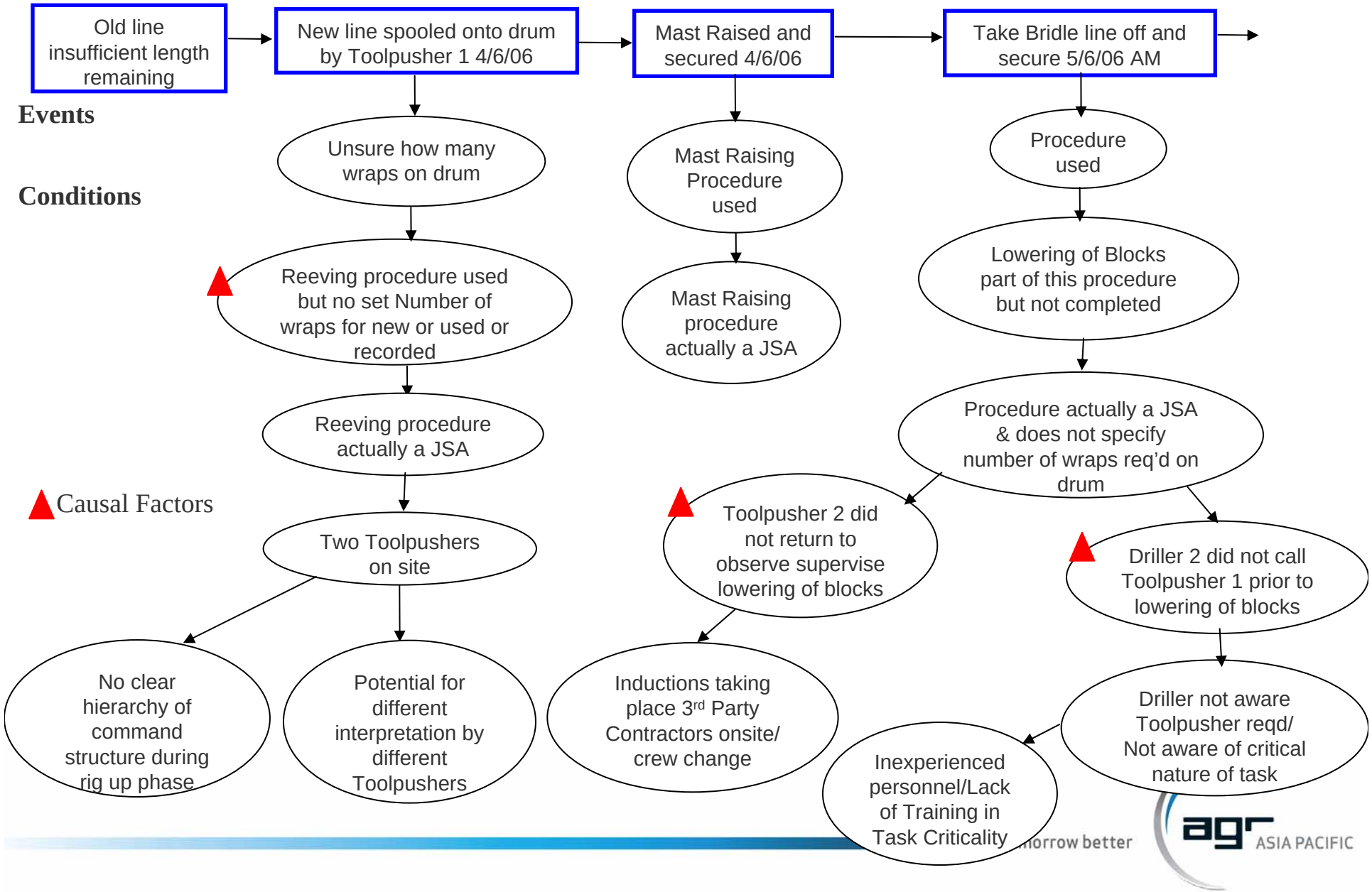
Why it happened…..

And how it has been corrected

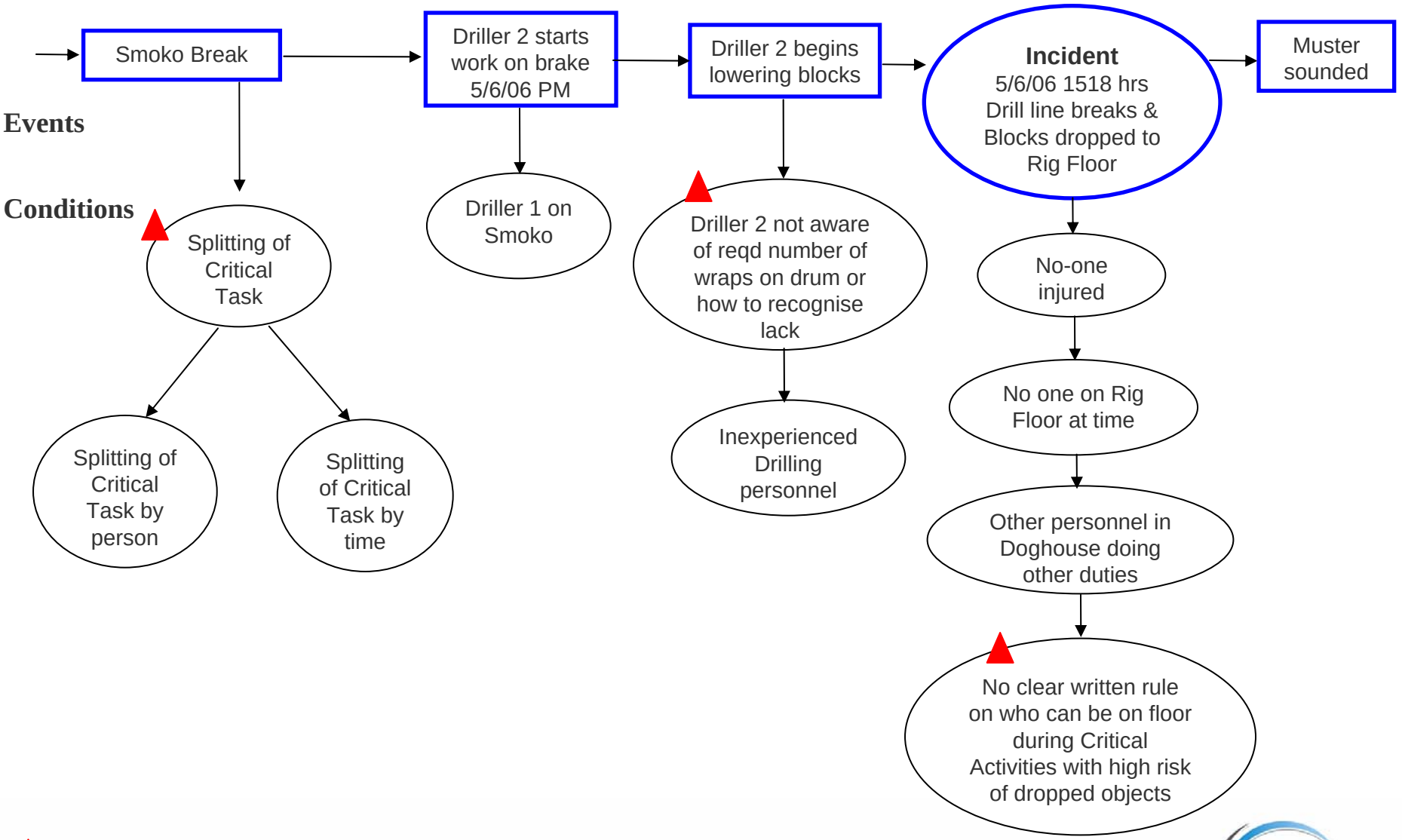
Generic Root Causes

- Personnel Experience and Training
- Resource Levels
- Documentation

Dropped Block Near Miss Investigation SnapCharT™



Dropped Block Near Miss Investigation SnapCharT™



▲ Causal Factors

Corrective Actions

- **Specific procedures developed**
  - Toolpusher to be present during slipping cutting and raising/lowering derrick
  - Numbers to be minimised around the rig floor during periods of high dropped objects risk
  - Number of wraps recorded in procedure
- **Plaque attached to draw works** indicating minimum number of wraps to be maintained
- **A toolbox meeting** and revised PTW is to be carried out if task resumed over period of time has elapsed or work party changed
- All critical tasks such as rigging up, were done under **PTW system & included a JSA**
- **AGR site induction** adapted to include a statement that 3rd party inductions and interactions are not to interfere with rig activity
- **Safety Alert** issued

Thank-you for your time

QUESTIONS?

Policy and Procedure Update and Enforcement

Dropped Blocks Incident

After the recent incident that occurred on Hunt Rig 3 when the blocks were dropped to the rig floor, the following policies and procedures have been set in place to prevent (avoid) the reoccurrence of the incident.

1. A permit to work will be raised to perform each of the following tasks:
    a. Raise the mast
    b. Lower the mast
    c. Slip drill line
    d. Slip and cut drill line
    e. Respool drill line

2. The Rig Manager will be present on the drill floor for:
    a. Spooling initial drill line onto the drum while blocks are on catwalk to ensure correct and adequate drill line is spooled.
    b. Drilling line and anchor retaining plate are fitted to drum anchor point
    c. When respooling line to drum for slip and cut procedures
    d. For all raising or lowering of the mast during rig up and rig down operations
    e. When lowering blocks from mast raising fitting/removing point
    f. When hanging or releasing blocks for slip and cut operations until blocks reach the pick up point

3. Revised JSA/SOP will be produced for each of the above tasks and set in place immediately upon production

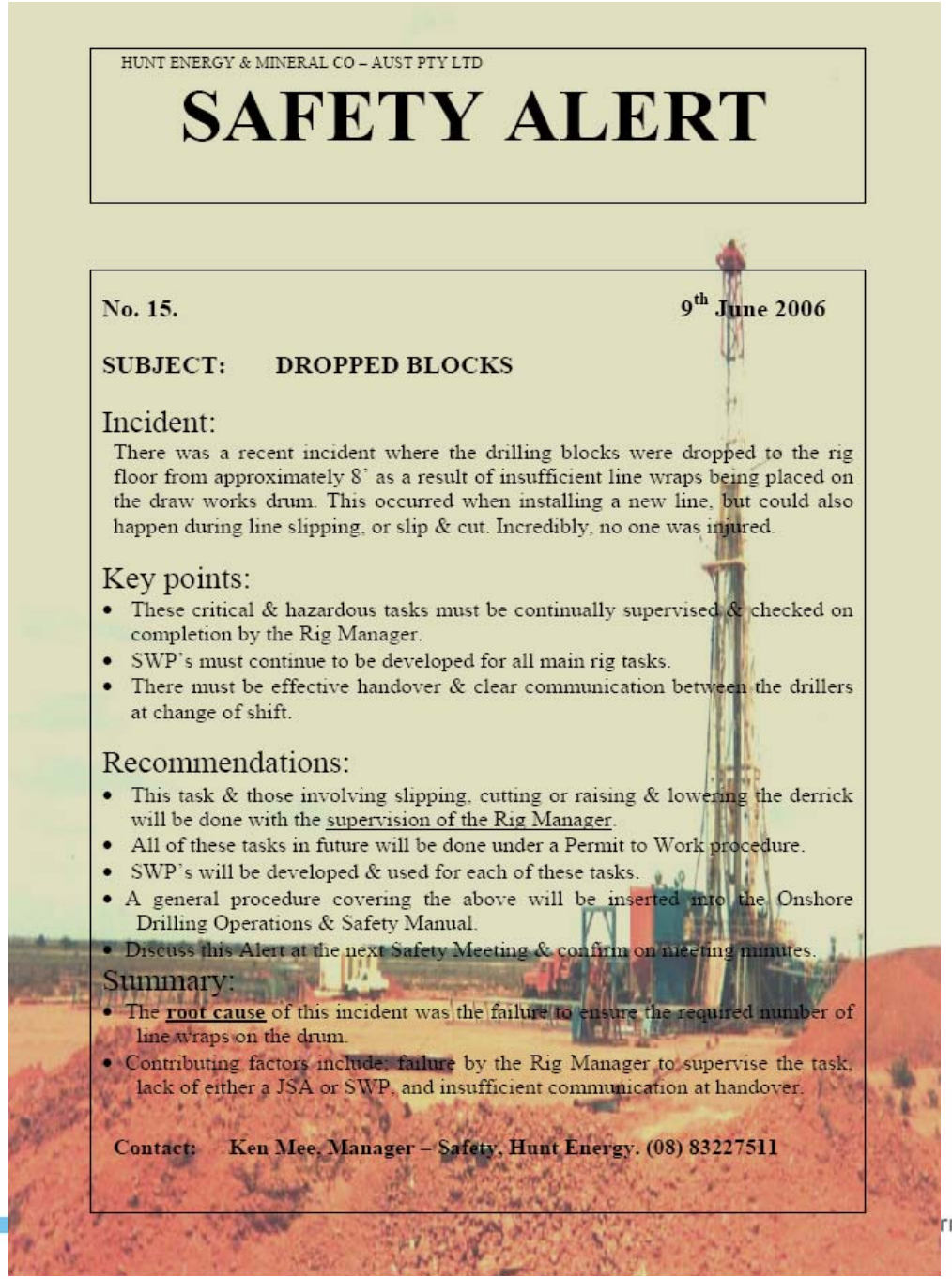
4. An accurate count of the wraps will be made when the mast is next laid down (at completion of ZeroGen 1) to determine the minimum number of wraps required to enable mast to be raised and blocks to be lowered to floor pick up point while retaining adequate holding wraps on the drum.

5. A plaque will be produced and fitted to a prominent point on the rig controls so that all drillers have knowledge of the minimum number of wraps to be on the drum before raising/lowering the mast.

6. Blocks will be securely hung while slipping or slipping and cutting drill line

7. Advisory notices will be posted on the Hunt safety notice boards stating the number of wraps on the drum for mast raising and lowering

8. A safety alert with the incident details, causes and subsequent improvements to operations will be issued to the industry.



HUNT ENERGY & MINERAL CO – AUST PTY LTD

SAFETY ALERT

No. 15. **9th June 2006**

SUBJECT: DROPPED BLOCKS

Incident:

There was a recent incident where the drilling blocks were dropped to the rig floor from approximately 8' as a result of insufficient line wraps being placed on the draw works drum. This occurred when installing a new line, but could also happen during line slipping, or slip & cut. Incredibly, no one was injured.

Key points:

- These critical & hazardous tasks must be continually supervised & checked on completion by the Rig Manager.
- SWP's must continue to be developed for all main rig tasks.
- There must be effective handover & clear communication between the drillers at change of shift.

Recommendations:

- This task & those involving slipping, cutting or raising & lowering the derrick will be done with the supervision of the Rig Manager.
- All of these tasks in future will be done under a Permit to Work procedure.
- SWP's will be developed & used for each of these tasks.
- A general procedure covering the above will be inserted into the Onshore Drilling Operations & Safety Manual.
- Discuss this Alert at the next Safety Meeting & confirm on meeting minutes.

Summary:

- The **root cause** of this incident was the failure to ensure the required number of line wraps on the drum.
- Contributing factors include: failure by the Rig Manager to supervise the task, lack of either a JSA or SWP, and insufficient communication at handover.

Contact: Ken Mee, Manager – Safety, Hunt Energy. (08) 83227511

Causal Factors	Cause Category	Root Causes	Corrective Actions
Reeving Procedure used but no set number of wraps	Procedures	No specific procedure	**Specific procedures developed** for rig up and reeving that allows for spooling on of new or used lines that specifies minimum number of wraps
	Procedures	No clear distinction between JSA's and procedures	Procedures to be documented separately to JSA.*
	Work Direction	Permit not used	All critical tasks such as rigging up, were done **under PTW system & included a JSA** which was reviewed by Hunt and AGR
	Work Direction	Job Pre-briefing Needs improvement	All critical task jobs to have job pre-briefing on key components and hazards*
Toolpusher did not supervise lowering of blocks	Procedures	Procedure unclear on requirement for Toolpusher present	Revised procedure states requirement for **Toolpusher to be present during lowering of the blocks**
	Procedures	Prioritasation of Toolpusher's tasks unclear	Statement that 3rd party inductions and interactions is not to interfer with rig procedures a **permanent part of AGR site induction**
Driller did not call Toolpusher back to Rig Floor for lowering of blocks	Training	Task not analysed	Procedure revised with rig up procedures broken down into logical steps. Train drillers to be aware of tasks that have high risk and require presence of Toolpusher*
	Communication	Communication System needs improvement	PTW system and signoff checklists associated with controlled procedures were used to ensure clear instructions were used and understood. JSAs reviewed by both AGR rep and Hunt prior to signing PTWs

Causal Factors	Cause Category	Root Causes	Corrective Actions
Splitting of Critical Task of Securing Bridle procedure and lowering of blocks	Procedures	Bridle Line Procedure not clear on requirement for Toolpusher to be present	Critical tasks are to be carried out by one person over one shift or handover between personnel is carried out if task is split **A toolbox meeting** is to be carried out if task resumed over period of time has elapsed*
Driller nor aware of required number of wraps	Procedures	No procedure	Revised procedure states required number of wraps
	Training	Training	Drillers to be trained in procedure* Procedure update issued
	Work Direction	Walkthrough needs improvement	New Drillers were shown how to recognise required number of wraps. **Advisory notice issued for safety boards**
	Human Engineering	No labeling on drawworks drum to indicate minimum number of wraps	Minimum wraps measured when mast laid down. **Plaque attached to drum** indicating required minimum number of wraps to be maintained
Driller not aware of how to recognise lack of wraps	Training	Task Not Analysed	Minimum wraps identified in revised procedure Advisory notices include minimum wraps
No clear written rule on who can be on floor during Critical Activities	Procedures	No procedure	Note it is common rig practice for personnel **numbers to be minimised** around the rig floor during periods of high dropped objects risk. Revised procedure states which personnel are allowed in hazardous areas during activity.