

PBU - Management of Change

Work Order #	29314644
Action Tracking #	
Reference #	

STAGE 1 - INITIATION

Initiated by:	John Todd/ Andy Spano	Phone:	4578	<input checked="" type="checkbox"/> Permanent Change
Title:	NS Prod Chem	Date:	6/5/99	<input type="checkbox"/> Emergency Change
Department/Facility:	CIC			<input type="checkbox"/> Temporary Change
Work Location:	WOA GC2 and GC3			<input type="checkbox"/> Duration End Date

Description of Change:

This MOC evaluates the elimination of the EC1081A corrosion inhibitor injection into the produced water at GC2 and GC3.

Reason for Change: See Attachment

The purpose of this MOC is to document the discontinuation of the produced water corrosion inhibitor and to examine the potential risks to the surface equipment as well as to the oil and water treating process. Funding for the continuation of this chemical program is not available, therefore it is being discontinued. The remaining inventory of the EC1081A will be utilized in the high risk S-69 produced water line until the stock is depleted.

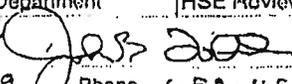
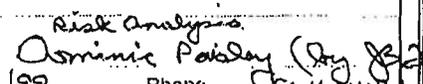
MOC CHECKLIST ("YES" for any of these items indicates the need for an MOC)

Yes	No	MOC CHECKLIST ("YES" for any of these items indicates the need for an MOC)
	<input checked="" type="checkbox"/>	Does this change require documentation revisions?
<input checked="" type="checkbox"/>		Does this change use equipment or parts that are not replacement-in-kind?
	<input checked="" type="checkbox"/>	Does this change add new or delete existing equipment?
	<input checked="" type="checkbox"/>	Does this change require modifications to operating limits, parameters, or logic?
	<input checked="" type="checkbox"/>	Does this change require revisions to existing BP or Contractor procedures?

STAGE 2 - DEVELOPMENT AUTHORIZATION

Yes	No	Responsibility	Activity	
<input checked="" type="checkbox"/>		End User Department	Development authorized?	
			If change has a precedent, complete Precedent Form and go to Stage 4.	
	NA	End User Department		
<input checked="" type="checkbox"/>		End User Department	Hazard Analysis method determined?	
<input checked="" type="checkbox"/>		End User Department	Process Hazards Analysis (PHA) required?	
<input checked="" type="checkbox"/>		End User Department	Documentation Checklist Initiated?	
<input checked="" type="checkbox"/>		End User Department	Detailed work package required?	
 CIC Team Leader			6-5-99 Date	4776 Phone

STAGE 3 - TECHNICAL AND HSE REVIEW

Yes	No	Responsibility	Activity
	<input checked="" type="checkbox"/>	Review Department	Review Team Lead assigned (if required).
<input checked="" type="checkbox"/>		Review Department	Technical Review Checklist completed.
<input checked="" type="checkbox"/>		Review Department	HSE Review Checklist completed.
Technical Reviewer 			HSE Reviewer 
Date 6/5/99 Phone 657-4578			Date 6/8/99 Phone 657-4466

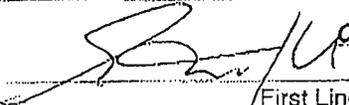
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STAGE 4 - AUTHORIZATION FOR CHANGE

Yes	No	Responsibility	Activity
X		End User Department	Change is authorized.
	X	End User Department	Does this change affect other Assets, create an HSE precedent or have external implications?

Change authorization is NOT approval for startup


 First Line Supervisor

 Date 6/10/99

 Phone x4905

STAGE 5 - END USER ACCEPTANCE

Yes	No	N/A	Responsibility	Activity
X		X	End User Department	Duration of temporary change and tracking system established.
		X	End User Department	Pre-Startup Safety Review completed (Ref: DOP #P-6-PM).
X			End User Department	Documentation Checklist reviewed and all applicable documentation complete. Attach Checklist to MOC.
		X	End User Department	Outstanding punchlist items assigned and scheduled.
X			End User Department	Forward documentation to Design/Drafting Supervisor.

Stage 5 must be approved before the change can be activated or put in service

Endorse this as a temporary change on the understanding that injection will recommence
 End User Department Superintendent at the start of 6/20/99 Date 6/20/99 Phone x4574
Paul Murogan

STAGE 6 - RECORDS

Yes	No	Responsibility	Activity
		Design/Drafting Supv.	Punchlist completion schedule received.
		Design/Drafting Supv.	All documentation complete.
		Design/Drafting Supv.	End User Department Superintendent advised on status of change.

Design/Drafting Supervisor _____ Date _____ Phone _____

COMMENTS (add attachments as required and note)

This is a unique chemical change MOC in that we are discussing the removal of a product and not the addition of one. In this case there are some risks to the equipment and the process associated with the discontinuation of this chemical program. While this change is defined as "permanent", the CIC Dept. will attempt to reinstate the program in the year 2000, if the budget is approved.

MOC DOCUMENT CHECKLIST

Work Order # 29314644

Action Tracking #

Reference #

ITEMS BELOW THAT ARE REQUIREMENTS OF THIS MOC NEED TO ACCOMPANY THE ORIGINAL MOC WHEN FORWARDING TO DESIGN DRAFTING FOR CLOSE OUT

DOCUMENTATION	REQUIRED		COMPLETED		ENCLOSED		COMMENTS
	Yes	No	Yes	No	Yes	No	
Design/Process Parameters		x					
Pre-startup Safety Review		x					not applicable in this case
Hazard Review	x		x		x		
Technical Review Checklist		x					no new chemicals are being introduced, one is being removed
HSE Review Checklist	x		x		x		
PROCEDURES							
- ESD Procedure		x					
- Inspection Procedure		x					
- Maintenance Procedure		x					
- Operating Procedure		x					
- PM Procedure		x					
- Testing Procedure		x					
- Other (note in Comments)							
TRAINING							
- E-Book Update		x					
- Informal (Toolbox, etc.)		x					not applicable in this case
- N/S Training Department		x					
Emergency Response Plans		x					
MSDS	x		x		x		included only to identify the product being discontinued
Computer System Updates (PLC, SCADA, etc.)		x					
FCO Documents		x					
Data Sheets / Process Safety Info		x					
Redlined Drawings		x					
MEL Information		x					
Other (note in Comments)		x					

Comments:
 The applicable GC's and the field OTL's have been notified of the discontinuation of the EC1081A at the GC's.

 Completed By _____ Date _____
 End User Acceptance _____ Date _____

TIMMI00

WORK TASK OUTLINE

06/05/99 07:43

W/O : 29314644 W/O Type = NR Status = PLAN 06/05/99
 Title : MOC FOR DISCONTINUING INJECTION OF THE PW CORROSION INHIB.
 Facility= WOA Work Status= OPEN Ref ID =
 Priority= R W/O Group = Outage =
 WO Due = 06/30/99 W/O Planner= TODDJB Proj = Prop:
 In Srvce: PM Early : PM Late: Attr:
 PCTR = Model W/O : Capital: N Sched: Est :
 Orig W/O: Mod W/O Rev: Reimbrs: N Cmpl: A/T :
 Xref W/O:

* TN	SN	Status	Pri	Pro	Ins	Rsc	Mtl	Doc	Req	Tls	Ots	Qc	Com	Eql	Description
<input type="checkbox"/>	01	<input type="checkbox"/>	PLAN	R	<input type="checkbox"/>	MOC FOR DISCONT									
<input type="checkbox"/>															
<input type="checkbox"/>															
<input type="checkbox"/>															
<input type="checkbox"/>															
<input type="checkbox"/>															

More:

Select to step thru task planning. Execute to create new task.

TIMM102

TASK INSTRUCTIONS

06/05/99 07:39

W/O Task: 29314644 01

Status: PLAN

06/05/99

Desc : MOC FOR DISCONTINUING INJECTION OF THE PW CORROSION INHIB.

* Description

The purpose of this MOC is to document the discontinuation of the
produced water corrosion inhibitor at GC2 and GC2. There are some
risks and potential process problems associated with this change. The
program is being discontinued due to budgetary constraints, even
though it has proven to be a very cost effective program.

More:

* Fac Work Std

Description

OLE Prt

Fac	Work Std	Description	OLE Prt

More:

Enter task instructions. Use More Detail to step through task planning.

Hazards Review Statement

To Be Completed by a Designated Authority and Attached to MOC

MOC Number: 29314644

MOC Description: Stop EC1081A PW CI Injection at GC-2 and GC-3

MOC Originator: John Todd/ Andy Spano

This Chemical Change does pose HSE / Financial risks.. The following is a brief description of the technical Review:

The corrosion mechanism in the PW system is microbially induced corrosion. Bacteria thrive in dirty systems and treatment requires injection of a chemical with strong surfactant and biocidal properties to clean the lines and reduce bacteria numbers. Various chemicals have been tried at GC-2 over the past year with the aim of finding a suitable, low cost chemical. The program has been successful and the data shows that the PW systems at GC-2 and GC-3 have been cleaned and bacterial numbers have been reduced. The corrosion monitoring and inspection data have also improved significantly.

The net effect of these improvements is to significantly increase the projected life of the PW system. Much of the system is in poor condition and, without injection of supplemental chemical, well line replacements are predicted from 2001 onwards, with flow lines from 2003 onwards. Supplemental injection is estimated to delay these near-term line replacements by approximately 7 years and many of the replacements would be delayed indefinitely. For example, the retirement of S-69 is predicted to be delayed from 2003 to 2016.

Suspending the supplemental injection in to the PW system is therefore unlikely to cause loss of containment or equipment retiral in the short term (1 to 2 years). However, it will shorten the life of the system, resulting in either abandonment or expensive repair/replacement in the medium to long term (3 years+). The longer the corrosion continues at the uncontrolled rate, the harder it will be to arrest it and achieve satisfactory life of the equipment.

Dominic Paisley
Printed Name

off for Dominic Paisley
Signature

Corrosion Engineer
Area of Authority

6/9/99
Date

Note: A Plant Change which is not a Replacement-in-Kind may require a Plant Change Request (PCR) to comply with OSHA regulations. See PCR Procedure if it is uncertain that this form is applicable.

Hazards Review Statement (Part I)

To Be Completed by a Designated Authority and Attached to MOC

MOC Number: 29314644

MOC Description: PW Corrosion Inhibitor Discontinuation

MOC Originator: John Todd/ Andy Spano

This Chemical Change does pose some HSE/ Financial risks. The following is a brief description of the risks to the Oil/ Water treatment process only:

In recent years, by far the largest negative impact to the oil and water quality at GC2 has been as a result of our produced water line pigging program, where the debris swept out of the line by the pig is returned via the LDF's to GC2. With the introduction in mid 1998 of a highly surface active water soluble corrosion inhibitor (EC1081A) injected directly into the produced water stream, we were able to substantially clean-up the surface water injection lines to the point where pigging returns at GC2 caused minimal disruption to the process. Water quality improved, which meant that less suspended solids went into the injection system, and the monthly BS&W averages declined to levels not seen for many years. In addition, the WOA induced upsets at Pump Station #1 declined dramatically.

The discontinuation of the EC1081A type chemistry into the produced water system represents a step backwards in our pursuit of producing oil and water that is consistently within the BPX guidelines. The end result of the program elimination is quite predictable - the quality of the oil and water produced by the WOA will decline, process upsets will be more frequent and much more severe, and stress on the mechanical equipment and infrastructure will increase.

John B. Todd
Printed Name
Production Chemistry
Area of Authority

[Signature]
Signature
6/6/99
Date

Note: A Plant Change which is not a Replacement-in-Kind may require a Plant Change Request (PCR) to comply with OSHA regulations. See PCR Procedure if it is uncertain that this form is applicable.

Produced Water - Corrosion Control

CIC 1Q 99 QPR

■ **Status of Supplemental Injection**

- GC-2: started July '98
- GC-3: started Feb '99
- Total cost \$1.5 M per annum(\$1.25 M in '99)

■ **System Simplification**

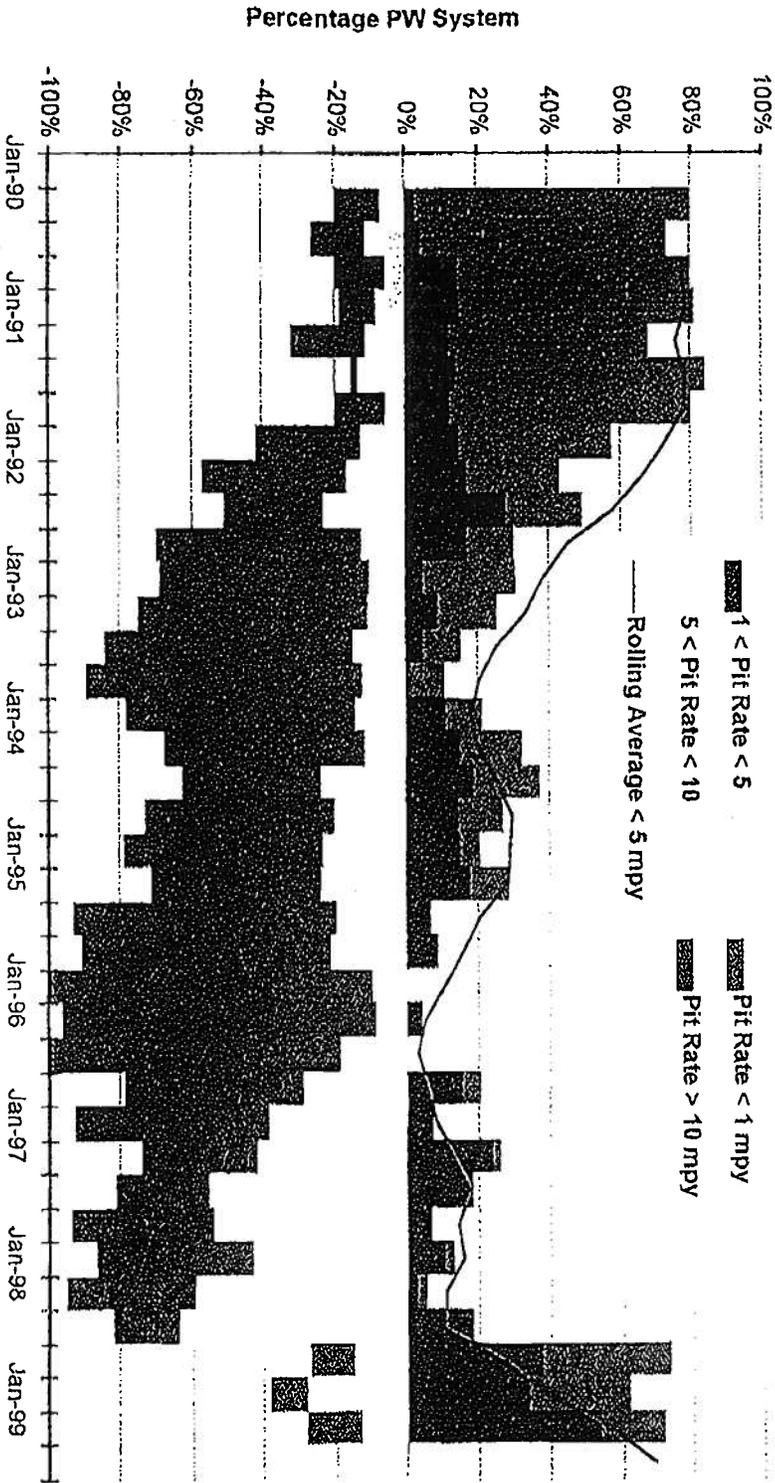
- T-pad well lines and F-T flowline to be abandoned in June
 - F-pad under consideration by reservoir team - decision by end 3Q
- WSW 2 line to be mothballed in July
- **Benefits**
 - Improves mechanical integrity through elimination
 - Stops corrosion & preserves infrastructure
 - Reduces costs associated with pigging & inspection

CIC Group

May 1999

Produced Water - Corrosion Control

Percentage of Produced Water System with Corrosion Under Control



CIC Group

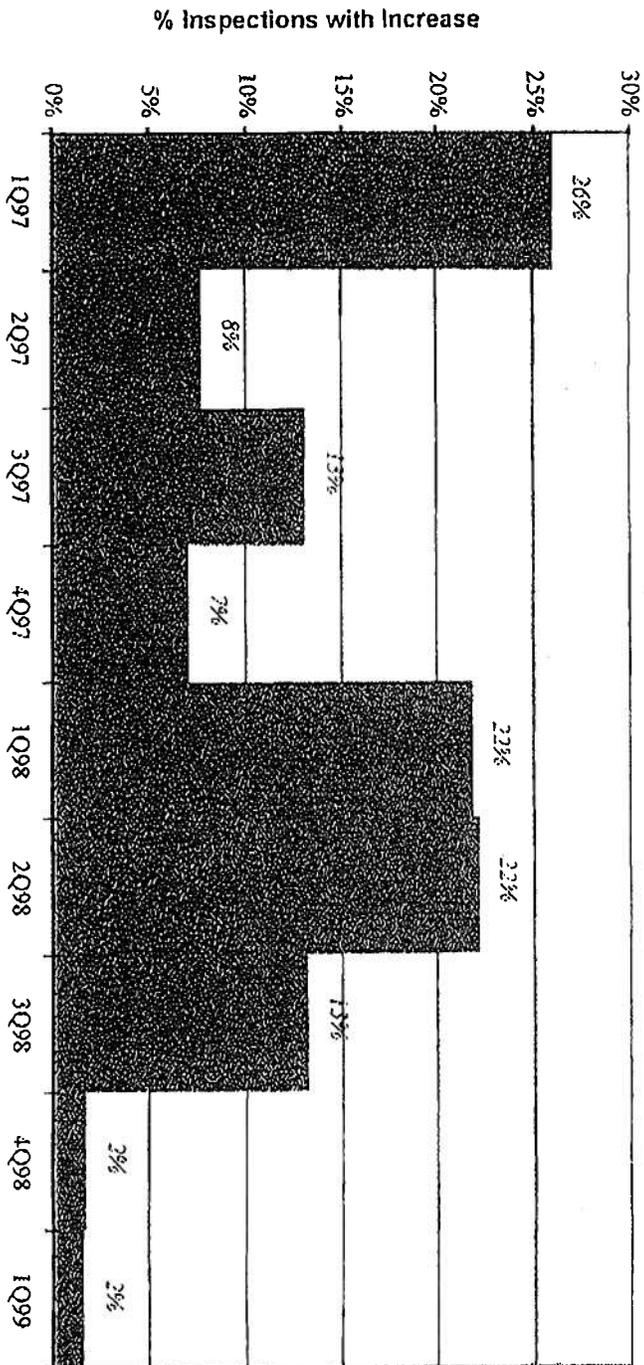
May 1999

CIC 1Q 99 QPR

Produced Water - Corrosion Control

CIC 1Q 99 QPR

GC2 Flowline PW Supply



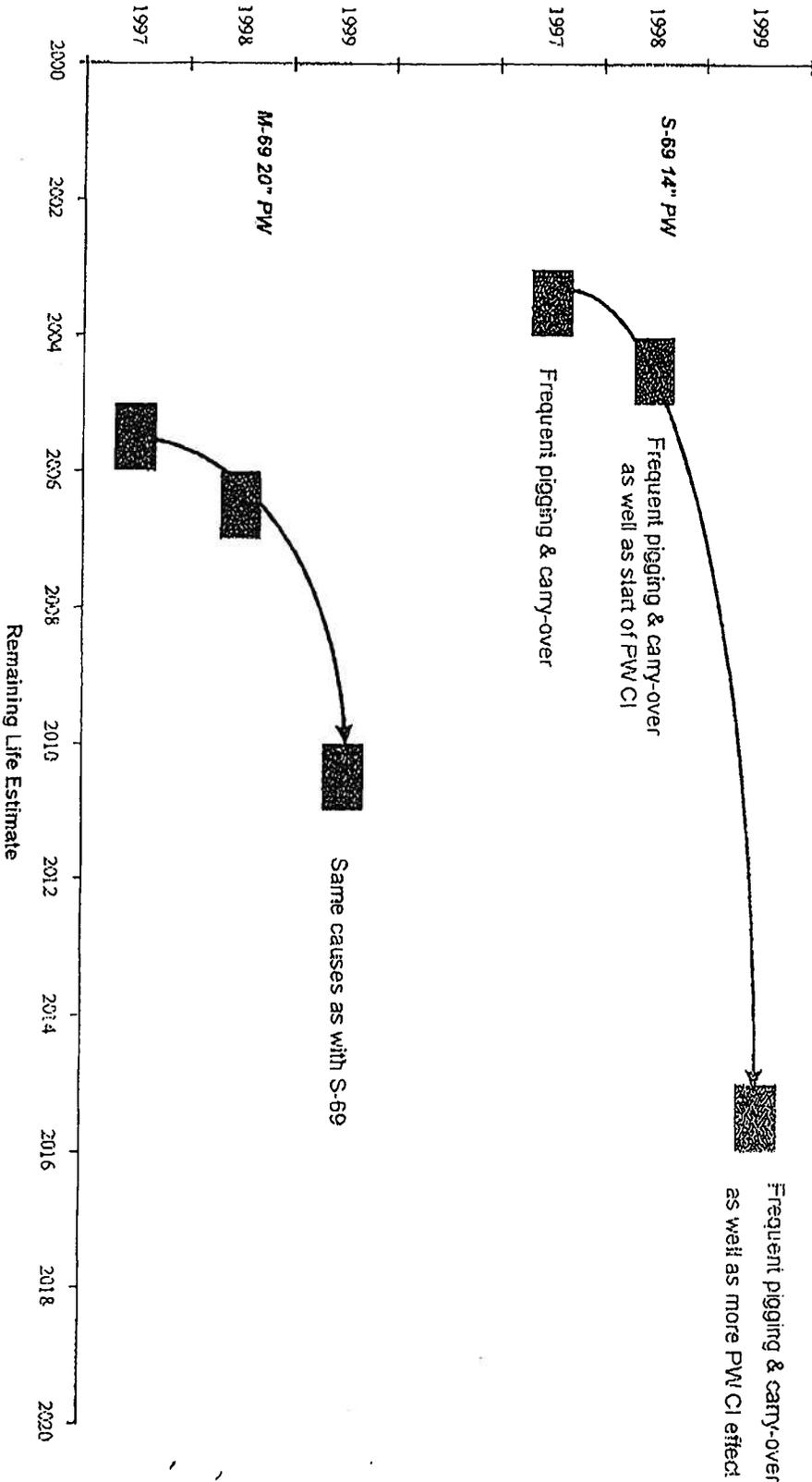
CIC Group

May 1999

Value Of Supplemental PW Injection - M&S FL'S

CIC 1Q 99 QPR

M & S PW Supply Life Model



CIC Group

May 1999

Produced Water - Corrosion Control

CIC 1Q 99 QPR

■ **Value of Supplemental Injection over 20 years**

- Option 1 - no injection
 - Cost of replacements: NPV \$ 36 million
- Option 2 - supplemental injection
 - Cost of replacements: NPV \$ 17.5 million
 - Δ over Option 1 NPV \$ 18.5 million
 - Cost of injection: NPV \$ 11 million
 - Cost benefit: NPV \$ 7.5 million
- Approach does not consider
 - Environmental cost due to leaks
 - Value of deferred oil due to PW system failures
- Conservative analysis
 - Cost reduction through optimisation of chemical
 - Minimum costs assumed for replacements
 - Life extended by 7 years
- Additional benefits due to reductions in BS&W and plant upsets

CIC Group

May 1999

Produced Water - Corrosion Control

CIC 1Q 99 QPR

■ **Near Term Actions**

- Implement injection at GC-1
- Mothball / abandon T-pad & WSW
- Achieve 100% compliance with Performance Measure
- Optimise chemical treatment for mechanical / reservoir life
- Re-visit options for not treating Cretaceous Injection water
 - Potential saving of \$250 K on annual basis

CIC Group

May 1999