

COMMENTS TO BE RETURNED TO:

COMPANY/PMC

FAX NO.:

FAX NO.:

BY DATE:

BY DATE:

Contractor Transmittal No.	T-DH-5578-E4-3967	Recd. Date	13 Apr 2011
Document No.	5578-E4-HSE-HU-00018	Rev. Date	09 Apr 2011
Document Title	Color Coding Procedure	Rev	1

COMMENTS:

By:

Signed

Date

Review Code:

- | | | |
|----------------------|---|--------------------------|
| 1. REJECTED | : REVISE AND SUBMIT | <input type="checkbox"/> |
| 2. COMMENTS AS NOTED | : WORK MAY PROCEED SUBJECT TO COMPLIANCE WITH AND INCORPORATION OF COMMENTS | <input type="checkbox"/> |
| 3. NO COMMENTS | : WORK MAY PROCEED | <input type="checkbox"/> |
| 4. INFORMATION ONLY. | : ACCEPTED FOR INFORMATION ONLY | <input type="checkbox"/> |

No. of Pages attached to this form :



**RUWAIS REFINERY
EXPANSION PROJECT**

**EPC-4 TANKAGE AND ASSOCIATED
INTERCONNECTING PIPING**

AGREEMENT No. 09-5578-E-4

DAEWOO E&C

PROJECT No. 5578

Doc. No. 5578-E4-HSE-HU-00018

Rev. 1

Page 1 / 15

**COLOR CODING
PROCEDURE**

AGREEMENT NO. : 09-5578-E-4

PROJECT NAME : Ruwais Refinery Expansion Project
EPC-4: Tankage & Associated
Interconnecting Piping

COMPANY : Abu Dhabi Oil Refining Company (TAKREER)

PMC : Mott MacDonald Ltd.

CONTRACTOR : Daewoo Engineering & Construction Co., Ltd.



**RUWAIS REFINERY
EXPANSION PROJECT**

**EPC-4 TANKAGE AND ASSOCIATED
INTERCONNECTING PIPING**

AGREEMENT No. 09-5578-E-4

DAEWOO E&C

PROJECT No. 5578

Doc. No. 5578-E4-HSE-HU-00018

Rev. 1

Page 2 / 15

This page is a record of all revisions of this document. All previous issues are hereby superseded and are to be destroyed.

Proprietary Information: This document contains proprietary information and may not be partly or wholly reproduced without prior written permission from TAKREER and/or Daewoo Engineering & Construction Co., Ltd.							DOC. CLASS	T/1
							DIST. CODE	18/19
1	09 Apr 2011	Issued For Construction	A Mesquita	DY Kim	V Bower	J H Lee		
0	30 Jun 10	Issued for Construction	C Wardman	D Y Kim	J.Brand	M.Heo		
REV	DATE	REASON FOR ISSUE	PREP	CHKD	REVD	APP'D	COMPANY	
SIGNED (Initials)								

NOTES:

- (a) Revisions are denoted by a vertical line placed in the right-hand margin against the revised text.
- (b) PREP = Prepared by, CHKD = Checked by, REVD = Reviewed by, APP'D = Approved by.
- (c) In case of conflict between any requirements stipulated in this document with the contractual requirements, the contractual requirements shall prevail.



**RUWAIS REFINERY
EXPANSION PROJECT**

**EPC-4 TANKAGE AND ASSOCIATED
INTERCONNECTING PIPING**

AGREEMENT No. 09-5578-E-4

DAEWOO E&C

PROJECT No. 5578

Doc. No. 5578-E4-HSE-HU-00018

Rev. 1

Page 3 / 15

REVISION INDEX DETAILS

Rev	Location of Change	Brief Description of Change
1	Attachment	Updated Quarterly Colour code Scheme

TABLE OF CONTENTS

1. INTRODUCTION	5
1.1 Purpose	5
1.2 Scope	5
1.3 References	5
2. DEFINITIONS	6
3. RESPONSIBILITIES.....	7
3.1 Project Manager	7
3.2 Construction Manager	7
3.3 HSES Manager	7
3.4 Discipline Managers	7
3.5 Competent Persons	7
3.6 Security Personnel	8
4. COLOR CODING PROCEDURE	9
3.1 Criteria for application	9
4.2 Color coding procedure.....	9
4.3 Defective tools and equipment	10
4.4 Inspection Records	10
5. TRAINING.....	11
6. ATTACHMENTS	11
6.1 Quarterly Color Coding Scheme	12
6.2 Inspection Registers	13
6.3 Competent Persons Appointment Certificates	14
6.4 Color Coding Matrix	15

1. INTRODUCTION

The color coding procedure should be read in conjunction with the HSE Audit and Inspection Procedure (Doc. No. 5578-E4-HSE-HU-00031). The intent of the procedure is to provide a system to easily identify tools and equipment that is used on the Ruwais Refinery Expansion Project (Hereafter "PROJECT") has been inspected and declared fit for purpose by competent persons.

1.1 Purpose

The purpose of this procedure can be summarized as follows;

- Clearly define the color coding that will be used during different periods of the PROJECT.
- Define what tools and equipment will require inspection and color coding
- Clearly define the requirements for competent persons to carry out the inspections
- Describe a system to register and keep record of the relevant inspections
- Provide a system for the tagging and removal of defective equipment

1.2 Scope

This procedure is applicable to all persons using tools and equipment as described in this procedure, as well as persons carrying out the inspections on tools and equipment.

1.3 References

- HSE Audit and Inspection Procedure (Doc. No. 5578-E4-HSE-HU-00031)
- Takreer HSE Inspections (HSE CP-28)
- Takreer HSE Audits (HSE CP-34)

2. DEFINITIONS

Audit	An independent, systematic and documented process of objectively obtaining and evaluating verifiable evidence to determine that business controls: <ul style="list-style-type: none"> - Are complete and consistent. - Are (cost) effective and efficient. - Safeguard DEC's resources and promote their effective use. - Provide, and protect the integrity of, required records and information. - Allow for compliance with policies, chosen standards, laws and regulations.
Competent Persons	Discipline specific persons who can understand the task and thus ensure the safety requirements of the task are appropriate. Competent persons are Site Engineers and/or task supervisors who are responsible for the execution of the work.
DEC	Daewoo Engineering and Construction Company Limited.
Hazard	The <i>potential</i> to cause harm , including ill health and injury, damage to property, products or the environment; production losses or increased liabilities
Incident	An event or chain of events which has caused or could have caused fatality, injury, illness and/or damage (loss) to assets, the environment, company reputation or third parties.
Inspection	A scheduled, structured examination of a work site with a specific focus on physical conditions and working practices in addition to normal supervisory duties.

3. RESPONSIBILITIES

3.1 Project Manager

Has the overall responsibility to ensure that this procedure is implemented and strictly followed on site.

3.2 Construction Manager

The Construction Manager has the following responsibilities;

- Ensure that Competent Persons are appointed in writing based on the guidelines of this procedure
- Responsible, through discipline Managers, that tools and equipment on site is in a good condition and fit for purpose
- Ensure that discipline Managers strictly follow this procedure

3.3 HSES Manager

The HSES Manager has the following responsibilities;

- Ensure that the color coding procedure is implemented and maintained throughout the PROJECT.
- Carry out relevant HSE training for Competent Persons (inspectors)
- Issue a badge and maintain records of Competent Persons (inspectors)
- Carry out periodic audits to ensure this procedure is consistently followed.

3.4 Discipline Managers

The Discipline Managers has the following responsibilities;

- Shall assign competent persons to carry out inspections as described in this procedure
- Ensure that competent persons carry out relevant training as required by this procedure
- Shall ensure that only up to date color coded tools and equipment are used on site
- Ensure that quarterly inspections are carried out and records are maintained of such inspections
- Monitor the maintenance and removal of defective tools and equipment

3.5 Competent Persons

Competent Persons (inspectors) have the following responsibilities;

- Shall attend the relevant HSE & 3rd party training courses as required
- Will carry out quarterly inspection and color coding for tools and equipment under their control

- Shall maintain records of inspections carried out, and present the same to the HSE Department whenever Audits or “spot checks” are carried out.
- Shall immediately remove defective tools and equipment from site for maintenance, repairs or disposal
- Will have relevant experience and qualification to carry out inspections on specific tools and equipment (also refer to color coding matrix).

3.6 Security Personnel

The Security personnel have the following responsibilities;

- Security shall support the implementation of this procedure as far as reasonably practical
- Shall ensure that only inspected tools and equipment, as defined in this procedure, is allowed on site

4. COLOR CODING PROCEDURE

The color coding procedure will be implemented for tools and equipment as described in this section. The procedure has to be read in conjunction with the HSE Audit and Inspection Procedure. It must be clearly understood that all tools and equipment must be inspected before every use, however this system describes the control of critical equipment.

The tools and equipment that are described in this procedure (see section 4.1) shall be inspected on a quarterly basis, apart from firefighting equipment, and the relevant color coding applied as defined in the attachments. The color coding will run on a two (2) yearly basis, i.e. eight (8) different colors, before the cycle starts over again.

4.1 Criteria for application

The following tools and equipment has to be inspected on the intervals as specified;

- 1) Firefighting equipment, i.e. fire extinguishers, fire alarms, smoke detectors, fire hydrants, firewater pumps, fire alarm control panels etc. (monthly, no color coding required)
- 2) Lifting tackle, i.e. web sling, wire rope, hook, shackle, turn-buckle (quarterly basis)
- 3) Fall arrest harness including double lanyard, shock absorber and auto locking snap hook (quarterly basis).
- 4) Portable & fixed electrical equipment, i.e. drill, skill saw, lighting, extension cords, distribution boards, re-bar cutter, grinders, plate benders etc. (quarterly basis)
- 5) Pneumatic equipment, i.e. compressors, grit blasting equipment, spray painting equipment, hydro-test equipment (quarterly basis)
- 6) Internal Combustion Engines, i.e. welding machines, generators, plate compactors etc. (quarterly basis)
- 7) Vehicles and Heavy Equipment, i.e. Sedans, pick-ups, sports utility vehicles, trucks, dump trucks, bulldozer, back-actor, rollers, shovels, rock-breakers etc. (quarterly basis)
- 8) Lifting appliances, i.e. cranes (hydraulic, cantilever, crawler etc.), man-lifts, fork-lifts, man-baskets, , come-a-long, chain block, tirfor, tri-pods, remote rescue kits etc. (quarterly basis)
- 9) Compressed Gas Equipment, i.e. Oxy-Acetylene equipment, Argon, Nitrogen etc. (quarterly basis)
- 10) Safety Equipment, i.e. Self Contained Breathing Apparatus, Gas Tester, Weather Monitors etc. (quarterly basis)

4.2 Color Coding Procedure

The following describes the general requirements for color coding after successful inspection;

- The color coding of tools and equipment denotes the successful completion of an inspection.
- The Competent Person will inspect the tools and equipment under his remit, and log the results in the inspection log

- On successful completion of the inspection, the relevant color coding will be applied.
- Color coding can be applied in the form of inspection stickers, insulation tape or spray paint (Please refer to color coding matrix for specification).
- The period for color coding is quarterly, however the Competent Persons will be required to start inspections two (2) weeks in advance of the new quarter to ensure that the work is successfully completed on time.
- Records shall be maintained and available for Audits and “spot checks” by the Competent Persons.
- New tools and equipment that is brought onto site shall firstly be inspected by the Competent Persons before being put into service.

4.3 Defective tools and equipment

- The Competent Persons will remove tools and equipment found unfit for use and ensure that it is replaced with tools and equipment that is in good working condition.
- Any tools and equipment that is found to be unfit for use shall be withdrawn from service until they are repaired if repair is possible.
- Tools and equipment that are repaired shall be inspected and tagged by the Competent Person before being put into service.
- The Competent Person shall inform the relevant supervisors of any tools and equipment that has been found unfit for use.
- Defective tools and equipment shall be repaired in accordance with manufacturer’s requirements.

4.4 Inspection Records

Inspection records shall be maintained by the Competent persons. The inspection records may include the following documents;

- Inspection Sheets (See HSE Audit and Inspection Procedure)
- Inspection register (mandatory)
- 3rd party certificates (as required, refer to color coding matrix)

The inspection records must be made available to the HSE Department whenever audits are carried out or for ad hoc “spot checks”. In case inspection records are lost, the tools and equipment shall immediately be withdrawn from service until such time as the Competent persons has re-compiled and inspected the tools and equipment.

5. TRAINING

Persons that are nominated to become competent persons will have to attend the HSE Color Coding and Inspection training module. The pre-requisite for the training will be as defined in the color coding matrix and should be verified by the trainer before training the persons.

On successful completion of the training the competent persons will be appointed in writing and will be issued with a competent persons ID badge. It must be noted that there may be a requirement for certain third party training before competent persons may attend the in house HSE training and become appointed as Competent Persons (Inspectors).

6. ATTACHMENTS

- 6.1 Quarterly Color Coding Scheme
- 6.2 Inspection Registers
- 6.3 Competent Persons Appointment Certificates
- 6.4 Color Coding Matrix

QUARTERLY COLOR CODING SCHEME

JANUARY – MARCH

YELLOW

APRIL – JUNE

RED

JULY – SEPTEMBER

GREEN

OCTOBER – DECEMBER

BLUE



**RUWAIS REFINERY
EXPANSION PROJECT**

**EPC-4 TANKAGE AND ASSOCIATED
INTERCONNECTING PIPING**

AGREEMENT No. 09-5578-E-4

DAEWOO E&C

PROJECT No. 5578

Doc. No. 5578-E4-HSE-HU-00018

Rev. 1

Page 14 / 15

COMPETENT PERSON APPOINTMENT CERTIFICATE

I, Mr. _____, with ID. No. _____, accept the responsibility of this authorization and will continue to familiarize myself with any revisions to the Color Coding and HSE Audit and Inspection procedure. I also accept full responsibility for all fire watch duties to which I am assigned.

I further undertake confirm that I have;

- Attended the necessary HSE training as well as 3rd party training if required
- I have at least 5 years experience in the field I'm carrying out inspections in
- I have a sound technical knowledge of the tools and equipment that I'm inspecting
- I'm fully aware of the manufacturer's requirements for the equipment I'm inspecting
- I will carry out the inspection duties to the best of my ability, and will never compromise on safety
- I will immediately inform my supervisor if defective/ unfit tools and equipment is found and withdraw the same from site
- I will maintain a register of inspection and make these available for review, at any time, to the HSE Department

Competent Person: _____ Contact Number: _____

Company: _____ Date: _____ Signature: _____

This is to certify that Mr. _____, with ID. No. _____, has met all the requirements necessary, and has sound knowledge, experience and qualifications to inspect the tools and equipment under his remit.

He is hereby authorized as a Competent Person.

Reviewed by: _____
HSE Manager

Approved by: _____
Construction Manager

**Ruwais Refinery Expansion Project
Color Coding Matrix**

DESCRIPTION		INSPECTION			COMPETENT PERSONS			
No	Category	Frequency	3rd party inspection	Certificates	Experience	Qualifications	3rd party training	HSE Training
1	Firefighting equipment	Monthly	Every 4 years On initial supply Once per year (visual)	Manufacturers certificate	5 years	NOF Level 4	NA	HSE Inspection & Color Coding Training Fire Watch Training
2	Lifting tackle	Quarterly	After substantial alteration or major repair At the discretion of the competent person	Manufacturers certificate	5 years	NOF Level 4	Lifting & Rigging	HSE Inspection & Color Coding Training Safe lifting and rigging training
3	Fall arrest equipment	Quarterly	NA	Manufacturers certificate	5 years	NOF Level 4	NA	HSE Inspection & Color Coding Training Site HSE Induction (Working at height) Lock out tag out training
4	Electrical equipment	Quarterly	NA	Manufacturers certificate	5 years	NOF Level 4	NA	HSE Inspection & Color Coding Training Power & Hand tools training
5	Pneumatic equipment	Quarterly	NA	NA	5 years	NOF Level 4	NA	HSE Inspection & Color Coding Training Power & Hand tools training
6	Internal Combustion Engines	Quarterly	NA	NA	5 years	NOF Level 4	NA	HSE Inspection & Color Coding Training Tire Safety Defensive Driving
7	Vehicles & Heavy Equipment	Quarterly	On initial supply (heavy equipment only) Every 2 years	Insurance	5 years	NOF Level 4	NA	HSE Inspection & Color Coding Training Tire Safety Defensive Driving
8	Lifting appliances	Quarterly	On initial supply (proof load test - pt) Once per year (visual) After every 4 years (proof load test) After substantial alteration or major repair (pt) At the discretion of the competent person (pt)	Insurance (cranes, forklifts, man-lifts only)	5 years	NOF Level 4	Crane Operation	HSE Inspection & Color Coding Training Safe lifting and rigging training MEWP's & Manbasket Safety Training
9	Compressed Gas Equipment	Quarterly	Every 4 years	Manufacturers certificate	5 years	NOF Level 4	NA	HSE Inspection & Color Coding Training Hot Work Safety Training
10	Safety Equipment	Quarterly	Yearly calibration (gas tester, weather monitor) Every 4 years (SCBA)	Manufacturers certificate	5 years	NOF Level 4	Authorized Gas Testing	HSE Inspection & Color Coding Training Emergency Response Training (SCBA) Heat Stress (weather monitor)