



**Doosan Heavy Industries
& Construction**

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2008.08.14

No. : QA 08-253
To : U.S. Nuclear Regulatory Commission
Reference : Document Control Desk
Washington, DC 20555-0001
Subject : Response to US NRC Inspection Report

Reference : US NRC Letter dated July 18, 2008 and emailed July 21, 2008, US NRC Inspection Report No. 99901373/2008-201

Dear Sir/Madam ;

In response to US NRC letter dated July 18, 2008 (Reference 1), we submit corrective action status with specific action taken and plan for each Violation and Nonconformance as follows :

A. Reply to Notice of Violation

Identification No.	Doosan CAR No.	Schedule for Completion
Violation# 99901373/2008-201-01	CAR_080092	Completed

- (1) Doosan had issued Corrective Action Report to analyze root cause as required by QA Program and US NRC Inspection Report. The Violation had been occurred due to the lack of understanding the latest requirements of 10 CFR Part 21.
- (2) The procedure managing Defects and Failure to Comply of 10 CFR Part 21 had been revised to incorporate the Notice of Violation. The requirement of 'Evaluating deviations and failures to comply to identify defects and failures to comply associated with substantial safety hazards within 60 days of discovery' was added on paragraph 7.2 of the 10 CFR Part 21 implementing procedure PQAP-1602. The requirement of 'notifying the responsible officer within 5 days when it is determined that a defect that could cause a substantial safety hazard exists' was added on paragraph 7.6.2 of the 10 CFR Part 21 implementing procedure PQAP-1602. And the requirement of 'providing written notification to the Commission within 30 days of the initial notification' was added on paragraph 7.6.2.3 of the 10 CFR Part 21 implementing procedure PQAP-1602.
- (3) In order to prevent recurrence, all related personnel with regard to this matter had been trained to understand the revision contents. During US NRC Inspection, the intensive discussion to resolve issues was made with the NRC Inspectors how to incorporate the regulatory position into the procedure. The US NRC Inspection Team Leader satisfied with the revised procedure, revision 5, May 29, 2008 without further comments.

JE09

B. Reply to Notice of Nonconformance

Identification No.	Doosan CAR No.	Schedule for Completion
Nonconformance#99901373/2008-201-01 (CGI Survey)	CAR-080094	October 30, 2008

- (1) Doosan had issued Corrective Action Report to analyze root cause, corrective action to prevent recurrence as required by QA Program and US NRC Inspection Report. The Nonconformance had been occurred due to the lack of understanding the requirements of US NRC's Position specified in NRC Inspection Report. Up to US NRC Inspection, Doosan Quality Procedures for Dedication of CGI had been established in accordance with 10 CFR 21 as well as EPRI Guide NP-5652 so that the dedication is assured by identifying the critical characteristics of the item and verifying their acceptability by inspections and tests after delivery, supplemented as necessary by one or more of 1) commercial grade surveys, 2) product witness at the manufacturer's facility and 3) analysis of historical records for acceptable performance. However, Doosan was not aware of that CGI Survey be performed for verifying identification and traceability of the heat and lot of the products when sampling inspection and test are employed. In addition to Doosan procedures, Doosan will perform CGI Survey for the vendors who supply commercial grade items when the Inspections and Tests are based on sampling method.
- (2) In order to prevent recurrence, the vendor evaluation procedure will be revised to reflect the Doosan Quality Level 'CGI' to take place the CGI vendor on the Approved Vendor's List. All related personnel with regard to this matter will be trained to understand the revision contents.

Identification No.	Doosan CAR No.	Schedule for Completion
Nonconformance#99901373/2008-201-01 (CGI Dedication Procedure)	CAR-080098	October 30, 2008

- (1) Doosan had issued Corrective Action Report to analyze root cause, corrective action to prevent recurrence as required by QA Program and US NRC Inspection Report. The Nonconformance had been occurred due to the lack of understanding the definition specified in the latest 10 CFR Part 21.
- (2) In order to prevent recurrence, the procedure will be revised to incorporate the latest definitions of 10 CFR 21 as required by NRC Inspection Report. All related personnel with regard to this matter will be trained to understand the revision contents.

Identification No.	Doosan CAR No.	Schedule for Completion
Nonconformance#99901373/2008-201-02	CAR-080096	October 30, 2008

- (1) Doosan had issued Corrective Action Report to analyze root cause, corrective action to prevent recurrence as required by QA Program and US NRC Inspection Report. The Nonconformance had been occurred due to the lack of understanding the requirements of US NRC's Position specified in NRC Inspection Report. Up to US NRC Inspection, Doosan QA Programs has been established in accordance with ASME Section III as required by the contract for United States project. According to ASME Section III NCA-3561, the Certificate Holders whose scope includes supply or manufacture of materials, need not be surveyed nor audited for work or material covered by the scope of their certificate. For that very reason, Doosan was not aware of that one or more of 1) review of the performance history, 2) review of the quality assurance record and 3) quality audit and survey be performed prior to award of contract, regardless of holding ASME Certificates. In this point of view, all ASME Certificate Holders will be facing with same situation so that Doosan suggest US NRC must make clear what exact requirements be applied for them. In other word, the Certificate Holder always shall apply NQA-1-1994 via

ASME III NCA-4000 and they shall not directly go into NQA-1-1994 requirements so that ASME III NCA-3561 always override the vendor evaluation requirements specified in 3.1, 7S-1, NQA-1-1994. Nevertheless, Doosan will perform the evaluation of the vendor who holds ASME Certificates prior to award of contract.

- (2) In order to prevent recurrence, the Doosan vendor evaluation procedure will be revised to reflect the evaluation methods such as review of the performance history, review of the quality assurance record and quality audit and survey which are specified in ASME NQA-1-1994, 7S-1, 3.1. All related personnel with regard to this matter will be trained to understand the revision contents.

Identification No.	Doosan CAR No.	Schedule for Completion
Nonconformance#99901373/2008-201-03	CAR-080095	October 30, 2008

- (1) Doosan had issued Corrective Action Report to analyze root cause, corrective action to prevent recurrence as required by QA Program and US NRC Inspection Report. The Nonconformance had been occurred due to the lack of understanding the requirements of Regulatory Guide 1.28. Up to US NRC Inspection, Doosan QA Programs has been established in accordance with ASME Section III as required by the contract for United States project. In addition to ASME III, Doosan also have to apply Regulatory Guide 1.28 which requires annual evaluation of the vendor. Doosan will also perform annual evaluation of the vendors who hold ASME Certificates except when no order awarded during evaluation period and order for simple and standard items such as tubular products, bars, bolts, nozzles, fittings which will be defined in the vendor evaluation procedure.
- (2) In order to prevent recurrence, the Doosan vendor evaluation procedure will be revised to reflect the annual evaluation for the vendors who hold ASME Certificates. The evaluation shall be documented and shall take into account, where applicable, 1) review of supplier furnished documents and records such as certificates of conformance, nonconformances, and corrective actions, 2) results of previous source verifications, audits, and receiving inspections and 3) results of audit from other sources such as customer, ASME, NRC audits. All related personnel with regard to this matter will be trained to understand the revision contents.

Identification No.	Doosan CAR No.	Schedule for Completion
Nonconformance#99901373/2008-201-04	CAR-080097	October 30, 2008

- (1) Doosan had issued Corrective Action Report to analyze root cause, corrective action to prevent recurrence as required by QA Program and US NRC Inspection Report. The Nonconformance had been occurred due to the lack of sufficient procedural requirements. Up to US NRC Inspection, there were errors in the approved vendor information such as evaluation date, expiration date etc. But, as it was reviewed and explained to the NRC inspectors during the inspection, Doosan reviewed all the information of the vendors and corrected all the errors, and there was no vendor that the errors could affect to their approval status.
- (2) In order to prevent recurrence, Doosan vendor evaluation procedure will be revised to reflect the definition of 1) approval date, 2) annual evaluation date, and 3) expiration date. The approval date defines the date printed by authorized personnel shown on the vendor evaluation report and/or vendor audit report, annual evaluation date defines the date printed by authorized personnel shown on the annual evaluation report, and expiration date defines 3 years after the approval date. All the related personnel with regard to this matter will be trained to understand the revised requirements.

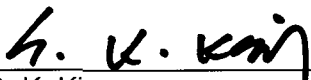
Identification No.	Doosan CAR No.	Schedule for Completion
Nonconformance#99901373/2008-201-05	CAR-080052	Completed

- (1) Doosan had issued Corrective Action Report to analyze root cause, corrective action to prevent recurrence as required by QA Program and US NRC Inspection Report. The Nonconformance had been occurred due to the lack of understanding the requirements of the procedure managing Defects and Failure to Comply of 10 CFR Part 21 so that four(4) NCRs were not evaluated the applicability of 10 CFR 21. These NCRs were related with welding defect and dispositioned by welding engineers. The personnel did not well understand the requirements of the procedure. As per CAR-080052, 10 CFR 21 applicability had been evaluated for four(4) NCRs and the result had been recorded on the original hard copy of each NCR.
- (2) In order to prevent recurrence, the Doosan nonconformance control procedure had been revised to add 10 CFR 21 applicability determination blank on nonconformance disposition form. And all related personnel with regard to this matter had been trained to understand the revision contents.

Identification No.	Doosan CAR No.	Schedule for Completion
Nonconformance#99901373/2008-201-06	CAR-080053	Completed

- (1) Doosan had issued Corrective Action Report to analyze root cause, corrective action to prevent recurrence as required by QA Program and US NRC Inspection Report. The Nonconformance had been occurred due to the lack of understanding the requirements of the procedure managing Defects and Failure to Comply of 10 CFR Part 21 so that ten(10) CARs were not evaluated the applicability of 10 CFR 21. Doosan was not aware that CAR also be determined 10 CFR 21 applicability however, the generic impact relative to other products, services, procedures, process or systems was evaluated for each CAR during the root cause analysis and corrective action. As per CAR-080053, 10 CFR 21 applicability had been evaluated for ten(10) CARs and the result had been recorded on the original hard copy of each NCR.
- (2) In order to prevent recurrence, the Doosan corrective action control procedure had been established to meet the requirements of 10 CFR 21. All related personnel with regard to this matter had been trained to understand the new procedure.

Very Truly Yours,


 S. K. Kim
 QA General Manager
 Doosan Heavy Industries &
 Construction Co., Ltd.

CC : The Chief, Quality and Vendor Branch 1, U.S. Nuclear Regulatory Commission

CAR NO.	:	CAR_080092
보고서번호		
Req Reply Date	:	2008-08-15
회신요구일자		

NCR/ADR/CAR No :
불일치/감사/시정번호

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DOOSAN

Related CAR No. CAR-080092

Root Cause Analysis & Corrective Action

Subject : 10 CFR Part 21 Procedure and Implementation
(NRC Inspection Report No. 99901373/2008-201, Notice of Violation)

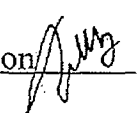
DOOSAN

Date : 2008. 08. 12

2008-08-12 20:51/원자력)원자력해외PM/H110910/손기영

Nuclear Overseas Project Management
Nuclear Business Group

Approved by : S. Y. Park 

Prepared by : K. Y. Son 

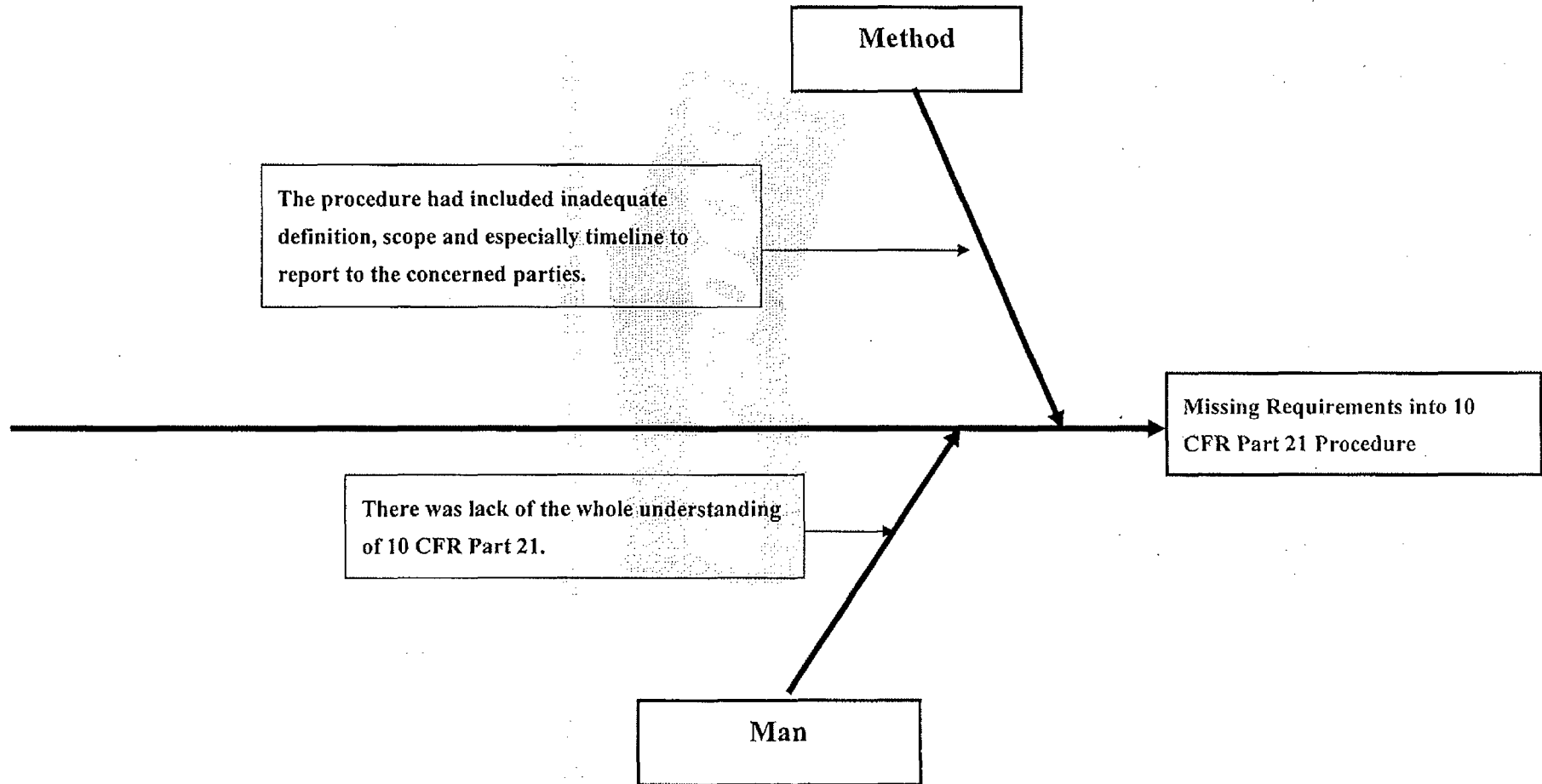
1. Summary Description of the Problem(Including Sketch, Photo, When necessary)

During the inspection, the US NRC reviewed Quality Assurance Procedure (PQAP-1602, Rev.4, Reporting of 'Defect' and 'Failures to Comply Pursuant to 10 CFR 21 dated May 16, 2008) with its implementation and found certain requirements not to provide procedural guidance for (1) evaluating deviations and failure to identify defects and failures to comply associated with substantial safety hazards within 60 days of discovery, (2) notifying the responsible officer within 5 days when it is determined that a defect that could cause a substantial safety hazard exists, and (3) providing written notification to the commission within 30 days of initial notification.

Contrary to the above, as of May 28, 2008, the three issues commented by the US NRC had not adequately been incorporated into Quality Assurance Procedure.

Except for the three issues that were identified on Notice of Violation, Doosan 10 CFR Part 21 program is consistent with the US regulatory requirements.

2. Root Cause Analysis



DOOSAN

Related CAR No. CAR-080092

Item No.	Cause	Room for improvement	Effectiveness	Remark
1	There was lack of the whole understanding of 10 CFR Part 21.	O	O	
2	The procedure had included inadequate definition, scope and especially timeline to report to the concerned parties.	O	O	

O : High, △ : Middle, × : Low

3. Corrective Action to prevent recurrence

Root Cause	Corrective Action	Who When	Status of After Corrective Action
There was lack of the whole understanding of 10 CFR Part 21.	The training to the concerned team was completed on June 13, 2008 and the implementation of 10 CFR Part 21 will be confirmed through the internal audit by QA	PM/QA (2008.06.13 ~)	Completed
The procedure had included Inadequate definition, scope and especially timeline to report to the concerned parties.	The intensive discussion to resolve issues was made with the NRC inspectors as to how we should incorporate their comments and the procedure had been revised to Revision 5 on May 29, 2008. The US NRC was satisfied with the revised procedure without further comments.	PM (2008.05.29)	Completed

DOOSAN

Related CAR No. CAR-080092

4. Generic impact relative to other products, services, procedures, process or systems

None

품질보증프로그램 교육훈련 계획

Training & Indoctrination Schedule
for Quality Assurance Program

Schedule No : TS-0806-01

작성일자 : 2008.06.10

1. 교육교과목

- 원자력BG 품질관리절차서(NQCP-300, Rev. 22, 2008.05.28) 및 QAP개정사항
;첨부, 개정요약사항 참조 (PQAP-1602 R.5포함)

2. 교육대상자 : 원자력해외PM

3. 교육 일시 : 2008.06.12

4. 강의 방법 : 회람

5. 교육 장소 : N/A

승인자 :

S. B. Park

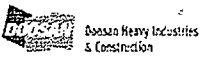
박 수 영
원자력해외PM장

6/10/08

일 자

원자력 BG 품질관리절차서(NQCP-300, Rev.22,2008.05.28), QAP 개정사항 요약

구분	QCP NO/ QAP NO	조항	주요 개정 내용	해당 조직
NQCP	NQCP-0301 설계관리절차	A7.2.2	설계변경 및 착수전 품질점검시 계약특성을 고려하여 국내프로젝트는 NQCP-0304D, 해외프로젝트는 NQCP-0304F 적용요건을 추가함.	설계부서 생산기술부서 품질관리부서
	NQCP-0304D(국내) NQCP-0304F(해외) 설계변경심의절차	신규 제정	NQCP-0301(설계관리절차) A7.2.2 변경에 따라 설계변경심의 절차 (국내프로젝트 : NQCP-0304D, 해외프로젝트 : NQCP-0304F) 신규 수립, 기존의 설계변경심의절차 NQCP-0304 는 폐지함.	설계부서 품질관리부서 생산기술부서
	NQCP-1501 부적합사항관리 절차	6.4.14	10 CFR 21 적용방법 추가 부적합보고서 또는 기술검토서에 “ Report to 10 CFR21 ()Tes ()No” 표기 기술검토서 양식은 모든 부적합보고서에 첨부되어야한다. 요건 추가	품질관리부서 설계부서 생산기술부서
	NQCP-1602 시정조치절차서	신규제정	원자력공사용 시정조치 절차서 신규 수립	품질관리부서
	NQCP-1603 시정조치 및 원인분석절차	3.1,3.3	예시 1 : 품질문제사례보고서 양식 변경에 따른 용의정의 변경	품질관리부서 설계부서 생산기술 생산부서
		6.1.1	부적합품 처리시 시정조치요구서 발행을 요구되었을 경우 품질문제사례 보고서 발행 불필요 요건 추가	
		6.1.2	원인분석 및 재발방지대책의 조치내용 승인자를 명확히 규정함.	
		6.1.3	품질문제 사례분석보고서의 승인자(원자력품질관리부 또는 비파괴검사 부 담당과장)를 명확히 규정함.	
		6.2.1	적용 시정조치절차서 번호 변경(BQCP-0601-> QCP-0601)	
		양식 1	품질문제사례보고서 ERP 양식으로 변경	
QAP	PQAP-0701 CGI 처리 절차	3.3	CGI 용어정의 구체적으로 기술	품질관리부서 설계부서
		4.0	두산중공업에 의한 Dedication 절차에 대한 Process 구체적 기술	
		Figure 1	CGI-acceptance Process 추가	
	PQAP-1602 R.5 10CFR21 에 따른 고장 및 결함처리	- Appendix 2	10 CFR21 에 따른 용어 보완 및 일부 절차 변경 (NRC Comment 사항 반영) Notification Form 보완	사업관리부서 품질관리부서 설계부서 생산부서


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Reporting of 'Defects' and 'Failures to Comply Pursuant to 10CFR21'

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8.0	DOCUMENTATION
9.0	APPENDICES


K. Y. Son	S. Y. Park	S. W. Park
May 29, 2008	May 29, 2008	May 29, 2008
NAME	NAME	NAME
DATE	DATE	DATE
Prepared by Nuclear Overseas PM Team	Reviewed & Approved by Nuclear Overseas PM Team . Gen. Mgr	Reviewed & Approved by NQC Dept. Gen. Mgr.

 Doosan Heavy Industries & Construction	QUALITY ASSURANCE PROCEDURE. PQAP-1602	QAP NO : PQAP-1602 REV NO : 5 PAGE : 2 of 19
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Reporting of 'Defects' and 'Failures to Comply Pursuant to 10CFR21'

Revision History

No.	Date	Revision	Prepared	Reviewed & Approved by	Reviewed & Approved by
0	01/27/2003	O HANJUNG → DOOSAN O Origination Change	K.S.CHOI	S.W.PARK	J.H.BAIK
1	01/13/2006	- Editorial Changes According to Nuclear BG QCP	J.K.HAN	C.R.LEE	J.K.SEO
2	03/10/2006	- 7.6.3 amend : Notification to the NRC - 7.6.4 : addition - Appendix 4C amend Related Dept. Names	K.Y.SON	J.C.HWANG	J.K.SEO
3	06/28/2007	- 3.8 : addition - 5.6 amend : Notification to the US NRC - 6.4 amend : editorial change - 6.9 : addition	K.Y.SON	J.C.HWANG	S.W.PARK
4	05/16/2008	- 3.6, 6.5.(5), 7.8.1 : Editorial change - 4.2.5) addition - 7.6.1.1 : addition - 7.6.2.1 : Editorial change - Appendix 4 : amend Related Dept. Names	K.Y.SON	S.Y.PARK	S.W.PARK
5	05/29/2008	- Incorporated by NRC comments	K.Y.SON	S.Y.PARK	S.W.PARK

 Doosan Heavy Industries & Construction	QUALITY ASSURANCE PROCEDURE PQAP-1602	QAP NO : PQAP-1602 REV NO : 5 PAGE : 3 of 19
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Reporting of 'Defects' and 'Failures to Comply Pursuant to 10CFR21'

1.0 PURPOSE

The purpose of this procedure is to ensure that Doosan Heavy Industries & Construction Co., Ltd.(DOOSAN) complies with contractual requirements to identify, control and report applicable 'Defects' and 'Failures to Comply' as further defined and required by 10CFR21.


This procedure establishes the system through which DOOSAN shall identify, document and notify appropriate parties of the discovery, evaluation, disposition and notification of deviation and/or noncompliance (as defined herein) that could lead to a substantial safety hazard in any nuclear project for which DOOSAN and its vendors has furnished or is in the process of furnishing basic components or parts of such basic components.

2.0 APPLICABILITY AND SCOPE

2.1 This procedure applies to all DOOSAN and DOOSAN vendor and subcontractor activities and conditions associated with nuclear project items that are to be licensed by the USNRC and which, if deviation, could create a 'substantial safety hazard' as defined in applicable regulations.

2.2 This procedure includes the identification, evaluation, notification, disposition and resolution of deviation, as defined herein, that are found to be associated with individual items of nuclear projects supplied by DOOSAN or its vendors.

2.3 Deleted

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Reporting of 'Defects' and 'Failures to Comply Pursuant to 10CFR21'

3.0 REFERENCES

3.1 Deleted

3.2 10 CFR 21 Title 10, US Code of Federal Regulations, Part 21 – Reporting of Defects and Noncompliance

3.3 Deleted

3.4 Deleted

3.5 NQCP-1501 Control and Correction of Nonconforming Items and Activities

3.6 NQCP-1602 Control of Corrective Action

3.7 NQCP-1701 Control of QA Records

3.8 US Atomic Energy Act of 1954

4.0 DEFINITIONS

This procedure uses a number of highly specialized terms that have unique definitions as used by the US NRC in relation to compliance with the laws and regulations covering the nuclear power industry in the United States. For convenience, many of these terms are consolidated into the list found in this section.


4.1 Basic Component

(source: 10CFR21, Section 21.3)

(1)(i) When applied to nuclear power plants licensed under 10 CFR part 50 or part 52 of this chapter, basic component means a structure, system, or component, or part thereof that affects its safety function necessary to assure:

(A) The integrity of the reactor coolant pressure boundary;

(B) The capability to shut down the reactor and maintain it in a safe shutdown condition; or

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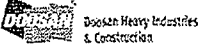
Reporting of 'Defects' and 'Failures to Comply Pursuant to 10CFR21'

- (C) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in 10CFR 50.34(a)(1), 10CFR 50.67(b)(2), or 10CFR 100.11 of this chapter, as applicable.
- (ii) Basic components are items designed and manufactured under a quality assurance program complying with appendix B to part 50 of this chapter, or commercial grade items which have successfully completed the dedication process.
- (2) When applied to other facilities and other activities licensed under 10 CFR parts 30, 40, 50 (other than nuclear power plants), 60, 61, 63, 70, 71, or 72 of this chapter, basic component means a structure, system, or component, or part thereof, that affects their safety function, that is directly procured by the licensee of a facility or activity subject to the regulations in this part and in which a defect or failure to comply with any applicable regulation in this chapter, order, or license issued by the Commission could create a substantial safety hazard.
- (3) In all cases, basic component includes safety-related design, analysis, inspection, testing, fabrication, replacement of parts, or consulting services that are associated with the component hardware, design certification, design approval, or information in support of an early site permit application under part 52 of this chapter, whether these services are performed by DOOSAN.

4.2 Defect

(source: 10CFR21, Section 21.3)

- (1) A deviation in a basic component delivered to a purchaser for use in a facility or an activity subject to the regulations in this part if, on the basis of an evaluation, the deviation could create a substantial safety hazard;
- (2) The installation, use, or operation of a basic component containing a defect as defined in this section;
- (3) A deviation in a portion of a facility subject to the early site permit, standard design certification, standard design approval, construction permit, combined license or manufacturing licensing requirements of part 50 or part 52 of this chapter, provided the deviation could, on the basis of an evaluation, create a substantial safety hazard and the portion of the facility containing the deviation has been offered to the purchaser for acceptance;
- (4) A condition or circumstance involving a basic component that could contribute to the exceeding of a safety limit, as defined in the technical specifications of a license for operation issued under part 50 or part 52 of this chapter; or
- (5) An error, omission or other circumstance in a design certification, or standard design approval that, on the basis of an evaluation, could create a substantial safety hazard.

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Reporting of 'Defects' and 'Failures to Comply Pursuant to 10CFR21'

4.3 Deviation

(source: 10CFR21, Section 21.3) The term 'deviation' means a departure from the technical requirements included in a procurement document.

4.4 Discovery

(source: 10CFR21, Section 21.3) The term 'discovery' means the completion of the documentation first identifying the existence of a deviation or failure to comply that is 'potentially' associated with a 'substantial safety hazard' within the evaluation procedures discussed in 10CFR21, Section 21(a).

4.5 Evaluation

(source: 10CFR21, Section 21.3) The term 'evaluation' is used to describe the process of determining whether a particular deviation could create a 'substantial safety hazard', or whether a 'failure to comply' is associated with a 'substantial safety hazard'.

4.6 Failure to Comply

(source: 10CFR50.55(e)(1)) Summary - The term 'failure to comply' refers to the construction of any item, or an activity, or a basic component supplied for a nuclear power plant or other nuclear facility 'fails to comply' with the United States Atomic Energy Act of 1954, as amended, or any applicable rule, regulation, order, US NRC license relating to a 'substantial safety-hazard'.

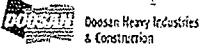
4.7 Responsible Officer

(source: 10CFR21, Section 21.3) Summary - the 'responsible officer' is the President, Head or Vice President or other individual within DOOSAN who is vested with executive authority over activities subject to 10CFR21. The President & CEO is the 'Responsible Officer' for DOOSAN 10CFR21 compliance. His designee for 10CFR21 compliance is the QA Vice President.

4.8 Deleted

4.9 Substantial Safety Hazard

(source: 10CFR21, Section 21.3) The term 'substantial safety hazard' specifically means a loss of safety function to the extent that there is a major reduction in the degree of protection provided to public health and safety as covered in 10CFR, 30, 40, 50, 60, 61, 70,

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71, or 72 as applicable.

Note 1 : Deleted

5.0 GENERAL

5.1 Posting Requirements Pursuant to the requirements of 10CFR21 "Reporting of Defects and Noncompliance", Subsection 21.6, Paragraph 21.6(b) copies of the 'Notice to Employees' shown in Appendix 4 shall be posted in conspicuous locations throughout DOOSAN wherever activities subject to 10CFR21 are performed.

5.2 | Deviations resulting in defects and failure to comply may result from problems of a generic nature relating to the adequacy or implementation of the overall DOOSAN QA Program and vendor's QA Programs. Such generically oriented deviations could affect one or more nuclear power plant projects to various degrees.


5.3 | Deviation may also result from specific quality problems directly affecting one or more current or past DOOSAN nuclear power plant projects.

5.4 | Various control systems are in place within DOOSAN to identify, control and resolve quality problems. These include design reviews, source inspections, receipt inspections, process inspections, product examinations, tests, nonconformance reports, internal and external audits, corrective action reports and trend analysis. Additionally, quality problems may be identified by vendors, customer audits and/or customer complaints.

5.5 | All deviation identified through any means shall be evaluated to the criteria contained in the definitions of 'defect', 'failure to comply' to determine whether the deviation may constitute a 'substantial safety hazard'.

5.6 | Those deviations that are evaluated and determined to represent a condition that could create a 'substantial safety-hazard' shall be reported to the Customer's designated representative or the US NRC in accordance with this procedure.


5.7 | In those cases where DOOSAN may not have sufficient information to make the determination, the matter shall promptly be brought to the attention of the purchaser. DOOSAN shall provide the purchaser with available background details as needed.

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Reporting of 'Defects' and 'Failures to Comply Pursuant to 10CFR21'

6.0 RESPONSIBILITY

- 6.1 Everyone in the DOOSAN organization has the responsibility to:
- (1) be alert to recognize activities and conditions which could represent or cause a deviation that could create a 'substantial safety hazard' as defined herein; and
 - (2) bring such activities and conditions to the attention of the appropriate representative of the DOOSAN Quality Assurance organization.
- 6.2 Each DOOSAN quality organization (QA, QC, and NDE Dept) have specific responsibilities relating to the identification, documentation, tracking and resolution of nonconforming conditions and activities as defined in applicable QCPs for the scope of activities assigned.
- 6.3 The President & CEO holds primary responsibility for DOOSAN's satisfactory compliance with the regulations of 10CFR21.
- 6.4 The QA Vice President, General Manager of QA, QC, and NDE Dept shall be responsible to:
- (1) ensure that any deviation concerning nuclear products or system identified within the scope of their responsibilities are screened and documented by properly trained personnel to the criteria established in the definitions of this procedure; and
 - (2) ensure that any deviation suspected to be 'defect', 'failure to comply' or could create a 'substantial safety hazard' are reported to the NQC General Manager for further evaluation and determination.
 - (3) ensure that all conditions that have been confirmed to be a 'defect', failure to comply' are reported to the applicable customer(s) and regulatory authorities as required by 10CFR21 and in accordance with this procedure.
- 6.5 The NQC Dept General Manager is responsible to:
- (1) ensure that any deviation concerning nuclear power plant products or system identified are screened and documented by properly trained personnel to the criteria established in the definitions of 'defect', 'failure to comply', 'substantial safety hazard'; and
 - (2) obtain appropriate Design Engineering review and for providing the quality aspect

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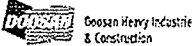
Reporting of 'Defects' and 'Failures to Comply Pursuant to 10CFR21'

review to provide a consolidated evaluation of the significance of the reported deviations;

- (3) immediate report to the Project Manager those 'defects', 'failure to comply' that have been determined to exist;
- (4) notify the Head of NBG, QA Vice President, concerned QC General Managers, and concerned management personnel when a 'defect', 'failure of comply' or potential 'substantial safety hazard' has been determined to exist ;
- (5) ensure that 'significant deviation' are processed and corrected in accordance with NQCP-1602, Corrective Action Procedure ;
- (6) regularly check the overall status of 'defects', 'failure to comply' concerning the assigned project and reporting the status to the Project Manager Head of NBG and QA Vice President .
- (7) notify the Head of NBG, QA Vice President , QA General Manager, concerned QC General Managers, and concerned management personnel when each 'defect', 'failure to comply' have been satisfactorily corrected and closed-out ;
- (8) provide copies of the final disposition with applicable documentation and technical justification of the disposition for each 'defect', 'failure to comply' to the Project Manager;

6.6 Each Project Manager (PM) is responsible to:

- (1) Immediately report to the Customer's designated representative, in accordance with Contract requirements, the details regarding all 'defects', 'failure to comply' that are determined to exist concerning the assigned project;
- (2) Immediately report to the NQC General Manager the details of any reported 'defects', 'failure to comply' received from Vendors and Subcontracted services;
- (3) maintain coordination with the each QC General Manager and concerned personnel within DOOSAN and its vendors relative to the progress of resolution of each 'defect', 'failure to comply' concerning the assigned project and providing progress reports to the Customer as required by contract.
- (4) submit the final disposition with applicable documentation and technical justification of the disposition to the Customer.
- (5) keep the QA Vice President informed of the notification to the customer and applicable regulatory authority including , follow-up, progress reports and close-out

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of each confirmed 'defect' or 'failure to comply'.

- 6.7 Each Design Engineering (DE) Dept General Manager is responsible for:
- | (1) evaluation of the technical aspects of each 'defect', 'failure to comply' identified and determine whether such conditions may represent a 'substantial safety hazard'..
 - | (2) review and approval of the adequacy and completeness for final disposition and technical justification of the disposition of 'defects', 'failure to comply'.
 - | (3) provide a summary of the evaluation on Notification Form.


- 6.8 Vendors of items, parts thereof, materials and quality related services, through requirements included in procurement documents and subcontracts, are responsible to :
- | (1) identify and process 'defects', 'failure to comply' detected within their scope of supply in accordance their QA Program as accepted by DOOSAN ;
 - | (2) report the details of each 'defect', 'failure to comply' to the applicable DOOSAN Project Manager ;
 - | (3) regularly report the status and progress of resolution of each 'defect' to the DOOSAN PM, and
 - | (4) submit the final disposition with applicable documentation and technical justification of the disposition of each 'defect', 'failure to comply' to the DOOSAN PM.

- 6.9 Each department or team General Manager is responsible for assuring that this procedure is trained to the team personnel.

7.0 PROCEDURE

- 7.1 | Any individual who becomes aware of a suspected 'defect', 'failure to comply' concerning any item subject to 10CFR21 and this procedure shall immediately notify the NQC General Manager regardless of the location or Business Group of DOOSAN where it is discovered or whether it is in the design, procurement, processing or testing stage or has been delivered.. Appropriate details and documented objective evidence, if available, shall be provided with the notification, or as soon thereafter as practicable.

- 7.2 | In the case of suspected 'defects', 'failure to comply' originally documented by nonconformance report or corrective action report, the General Manager of the applicable department responsible for the review and/or report shall make a preliminary determination of the significance of the deviation. This deviation considered to

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potentially represent a 'substantial safety hazard' as defined in this procedure, shall be brought to the attention of the NQC Dept General Manager.

DE & NQC Dep't evaluate deviations and failures to comply to identify defects and failures to comply associated with substantial safety hazards as soon as practicable, in all case within 60 days of discovery, in order to identify a reportable defect or failure to comply that could create a substantial safety hazard, were it to remain uncorrected

- 7.2.1 Disposition and correction of deviations identified in the normal process of QA Program implementation shall proceed in accordance with the applicable QCP. Those deviations that are determined after technical and QC review to be 'defect', 'failure to comply' or which may represent a 'substantial safety hazard' may require additional or different corrective action.

Upon determination, after mutual evaluation by the designated DE Dept and NQC representatives, that the suspected deviation does not represent a 'defect', 'failure to comply' as defined herein, the deviation shall be processed in accordance with the applicable QCP through which the deviation was originally documented.


- 7.2.2 Correction of suspected 'defect', 'failure to comply' which may require extensive reconstruction or extensive repair shall not proceed until after review and acceptance of the proposed disposition has been received from the Customer.

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- 7.5 If, after mutual evaluation by the designated DE Dept and NQC Dept representatives, it is determined that the suspect deviation does, in fact, represent a 'defect', 'failure to comply' then the deviation shall be controlled by this procedure. In the event the DE Dept and NQC Dept representatives can not reach mutual agreement, the suspect deviation evaluation shall be raised to the General Manager level within the DE and NQC Depts and the situation brought to the attention of the QA Vice President. The Head of QA Division has the authority, to make the final determination within DOOSAN.

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Reporting of 'Defects' and 'Failures to Comply Pursuant to 10CFR21'

7.6 Notification

7.6.1 The central point for determining whether a 'defect', 'failure to comply' associated with a 'substantial safety hazard' actually exists is the DOOSAN NQC Dept regardless of the source of the information. Internal-(design review, QC review, inspection, examination, test result, audit, trend analysis). External - (vendor notification, customer audit, customer performance complaint, etc.) or type of document (review, report, letter, facsimile, documented telecommunication, etc.) used to furnish the information concerning suspected defect or failure to comply.


7.6.1.1 If a deviation or failure to comply is discovered by Doosan for basic components, services, or services associated with basic components, and Doosan determines that they do not have the capability to perform an evaluation to determine if a defect exists, then Doosan PM will inform the purchasers or affected licensees within five (5) working days of this determination so that the purchasers or affected licensees may evaluate the deviation or failure to comply, pursuant to 21.21 (a).

7.6.2 After mutual evaluation of the technical and quality assurance aspects by the DE Dept and NQC Dept respectively, if it is determined that a 'defect', 'failure to comply' associated with a 'substantial safety hazard' exists, the NQC Dept General Manager or his designee shall notify the Head of NBG, QA Vice President, concerned responsible management, each QC General Manager and Project Manager of each affected Nuclear Power Plant Projects as soon as practicable, and in all cases, within the 5 working days.

7.6.2.1 PM will provide initial notification of a defect by facsimile, to the NRC Operations Center at (301) 816-5151 or by telephone at (301) 816-5100 within two (2) days following receipt of information by the responsible officer on the identification of a defect. Verification that the facsimile has been received should be made by calling the NRC Operations Center.

7.6.2.2 The initial notification shall include a brief description of the condition with sufficient details to indicate why it is determined to be a defect and shall identify all affected Nuclear Power Plant Projects.

7.6.2.3 Written notification to the NRC shall be made within 30 days following receipt of information by responsible officer.

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7.6.3 Upon notification that a 'defect', 'failure to comply' associated with a 'substantial safety hazard' exists concerning his project the Project Manager of each affected project shall immediately notify the Customer and NRC of the pertinent details. The PM's notification to the Customer and NRC shall be documented, signed and dated by the PM and a copy provided to the NQC Dept General Manager.

7.6.4 Ensure that if an evaluation of an identified deviation or failure to comply potentially associated with a substantial safety hazard can not be completed within 60 days from discovery of the deviation or failure to comply, an interim report is prepared and submitted to the customer and commission through a director or responsible officer or designated person as discussed in § 21.21(d)(5). The interim report should describe the deviation or failure to comply that is being evaluated and should also state when the evaluation will be completed. This interim report must be submitted in writing within 60 days of discovery of the deviation or failure to comply.

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7.8.5 Deleted

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8.0 DOCUMENTATION

8.1 Documentation associated with Deviation shall be controlled and maintained in accordance with NQCP-1701, QA Records Control Procedure.

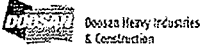
9.0 APPENDIXES

9.1 Deleted

9.2 Appendix 2 : Notification Form

9.3 Deleted


9.4 Appendix 4 : Notice to Employees

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Appendix 2 : Notification Form

<u>Part 21 Notification</u>					
To : Customer			From : DOOSAN () PM		
Title :					
Registration No.					
Date		Project		Quality Class	
1) Items/activities found defect			2) Description of the defect		
3) Evaluation summary					
4) The basis for concluding that defect exists					
5) Nature of the defect					
6) Defect identified date			7) Schedule for action		
8) Quantity, identity and current location of defect					
9) Responsible organization(Company, Department etc)					
10) Advise and recommendation to be provided to customer					
11) Reference documents					
12) Others					
Reported by :					
DOOSAN () QC General Manager			Date		

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Appendix 4 Notice to Employees.

The 'Notice to Employees' exhibited in this appendix shall be posted at all times in conspicuous locations throughout DOOSAN. The 'Notice to Employees' shall be posted both in the Korean language (Hangul) and English language. The posted notice shall be maintained up to date so that it accurately reflects the names, jobtitle, and phone numbers of the DOOSAN personnel to be notified.

The General Manager, Nuclear Quality Control Department shall be responsible for determining the specific locations for posting the notice. As a minimum, the posting locations shall be sufficient in quantity and prominently displayed to ensure that all employees in the departments and shops listed below have access to and the opportunity to read the notice:

QA -

QA office

Purchasing -

Raw Material Purchasing Team

Nuclear Purchasing Team

Logistic Service Department

Research and Development Institute

GA Department -

M&TE Calibration Section

Material Testing Section

Chemical Analysis Section

Welding Technology Research Section

Electrical and I&C Business -

Instrument & Control Engineering Department

Electrical & Controls Production Design Team

Customer Service

Nuclear Power Plant Service Team

Nuclear Power Plant Design -

S/G Design Department


R/V Design Department

Nuclear BOP Design Department

Project Management -

Nuclear Power Project Management

(projects subject to 10CFR21 only)

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Quality Control -

- Nuclear Quality Control Department
- Nondestructive Examination Department
- Casting and Forging Quality Control Department

Production Control -

- Casting and Forging Production Control Team

Nuclear Power Plant Production -

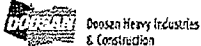
- Nuclear Manufacture Engineering Team
- Nuclear Production Control Team
- Nuclear Shop

Turbine/Generator Production -

- Turbine Shop

Casting and Forging Production -

- Casting and Forging Materials Engineering Team
- Forge Shop

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Reporting of 'Defects' and 'Failures to Comply Pursuant to 10CFR21'

Notice to Employees

DOOSAN constructs nuclear products that are subject to laws
of the United States of America, therefore
This facility is subject to the provisions of
Section 206 of the Energy Reorganization Act of 1974

Noncompliance – Section 206

- A. Any individual director, or responsible officer of a firm constructing, owning, operating, or supplying the components of any facility or activity which is licensed or otherwise regulated pursuant to the Atomic Energy Act of 1954 as amended, or pursuant to this act, who obtains information reasonably indicating that such facility or activity or basic components supplied to such facility or activity:
- (1) Fails to comply with the Atomic Energy Act of 1954, as amended, or any applicable rule, regulation, order, or license of the Commission relating to substantial safety hazards; or
 - (2) Contains a defect which could create a substantial safety hazard, as defined by regulations which the Commission shall promulgate;
- Shall immediately notify the Commission of such failure to comply, or of such defect, unless such person has actual knowledge that the Commission has been adequately informed of such defect or failure to comply.
- B. Any person who knowingly and consciously fails to provide the notice required by Subsection (a) of this section shall be subject to a civil penalty in an amount equal to the amount provided by section 234 of the Atomic Energy Act of 1954, as amended.
- C. The requirements of this section shall be prominently posted on the premises of any facility licensed or otherwise regulated pursuant to the Atomic Energy Act of 1954, as amended.
- D. The Commission is authorized to conduct such reasonable inspections and other enforcement activities as needed to ensure compliance with the provision of this section.


The Code of Federal Regulations require that each firm subject to 10 CFR 21 establish procedure and requirements for implementing Section 206 of the Energy Reorganization Act of 1974. This requirement is implemented by the DOOSAN procedure for Reporting of 'Defects' and Failures to Comply'(PQAP-1602).

This procedure is available from your department General Manager, or from the Nuclear QC Department, or QA Team. This procedure is also posted electronically on the DOOSAN Intranet. A copy of 10 CFR 21 may be examined in the Nuclear QC Department and QA Team. An employee who wishes to report a noncompliance issue subject to this Section 206 should refer to procedure PQAP-1602. A report may also be made to

Mr. S. W. Park, General Manager, Nuclear QC Dep't(Tel.5861) or to
Mr. N.Y. Hur, Manager, Nuclear QC Dep't(Tel.5648).

An employee may report a deviation or potential failure to comply directly to the NRC if they so choose.

DOOSAN: Doosan Heavy Industries & Construction Co., Ltd

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Reporting of 'Defects' and 'Failures to Comply Pursuant to 10CFR21'

알 림

두산중공업(주)는 미국 법령을 준수해야 하는 원자력 제품을 생산하고
있으므로
1974 년의 미국 에너지 재편성법
제 206 조의 규정을 지켜야 합니다.

부적합사항 - 제 206 조

- A. 1954 년에 수정된 미국 원자력법령을 따르도록 인가되거나 규정된 설비나 역무를 건설, 소유, 운전 또는 공급하고, 그러한 설비나, 역무 또는 그 설비나 역무에 공급되는 기본품목이
- (1) 1954 년에 수정된 미국 원자력법령이나 중대한 안전성 저해와 관련된 해당 규칙, 규정, 명령 또는 인가사항에 위배되었음을; 또는
 - (2) 미국 원자력 규제 위원회가 공포한 규정에 정해진 바와 같은 심각하게 안전성을 저해할 수 있는 결함사항을 포함하고 있음을 ;
- 나타내는 상세내역을 적법하게 알고 있는 각 조직의 책임자는 즉시 미국 원자력 규제 위원회에 그러한 사항에 대해 통보해야 한다. 단, 상기인이 위원회에 그러한 위배사항이나 결함사항을 적절히 통보해 왔음을 실질적으로 인지하고 있는 경우는 제외함
- B. 본 조에 의해 통보해야 할 사항을 알고도 의식적으로 하지않는 사람은 누구든지 1954 년에 수정된 원자력법령 제 234 조에 준하는 벌금을 물게 됨.
- C. 본 조의 요건은 1954 년에 수정된 원자력법령을 따르도록 인가되거나 규정된 설비의 구내에 눈에 잘 띄게 부착 되어야 한다.
- D. 위원회는 본 조의 준수여부를 확인하기 위해 필요 시 합리적인 검사와 별도의 활동을 수행할 수 있는 권한이 부여되어 있다.

10 CFR 21 를 준수해야 하는 각 회사는 1974 년 에너지 재편성법의 제 206 조를 이행할 수 있는 절차와 요건을 확립 해야 하는 미 연방 법에 따라, 당사는 “품질위배사항 및 결함사항 보고”에 관한 품질보증절차서 (PQAP-1602)를 수립, 운용하고 있습니다.

본 절차서는 소속 부서장이나 원자력품질관리부, 품질보증팀으로부터 이용 가능하며, 두산중공업(주) 인트라넷의 품질보증정보에 올려져 있습니다. 또한 10 CFR 21 사본은 품질보증팀 및 원자력품질관리부에서 보유하고 있으므로 누구든지 열람이 가능합니다.

본 206 조에 의거 부적합사항 발생을 보고하고자 하는 사람은 상기 절차서(PQAP-1602)를 참고해서 하기 책임자에게 보고하거나, 또한 원하는 사람은 품질위배사항이나 결함사항을 미국 원자력규제 위원회에 직접 보고할 수도 있습니다.

**보고처 : 원자력품질관리부 박세완 부장(Tel : 5861) 또는
원자력품질관리부 허남열 차장(Tel : 5648)**

품질보증프로그램 교육훈련 계획

Training & Indoctrination Schedule
for Quality Assurance Program

Schedule No : TS-0806-01

작성일자 : 2008.06.10

1. 교육교과목
 - 원자력BG 품질관리절차서(NQCP-300, Rev. 22, 2008.05.28) 및 QAP개정사항
;첨부, 개정요약사항 참조 (PQAP-1602 R.5포함)
2. 교육대상자 : 원자력해외PM
3. 교육 일시 : 2008.06.12
4. 강의 방법 : 회람
5. 교육 장소 : N/A

승인자 :

S. B. Park

박 수 영
원자력해외PM장

6/10/08

일 자

교육훈련계획

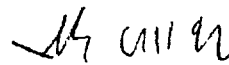
Training & Indoctrination Schedule

Schedule No: NQCD-NQCP-080609

작성 일자 : 2008.06.09

1. 교육 교과목 : 원자력품질관리절차서(NQCP-300 Rev.22) 개정본 및
PQAP-0701 REV.3, PQAP-1602 Rev.5 개정본,
품질관리계획서(QCM-200 Ed.1 Rev.5) 개정본
2. 교육 대상자 : 원자력품질관리부 직원
3. 교육 일 시 : 2008.06.09 ~06.16
4. 교육 강 사 : N/A
5. 교육 장 소 : N/A
6. 교육 방 법 : 회람(Self Study)

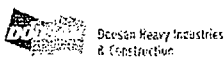
승인자 :


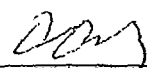
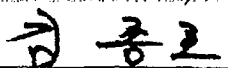
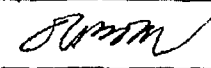

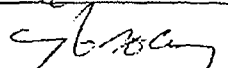
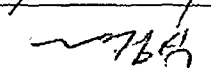
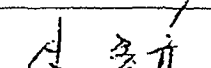
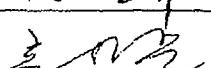
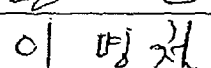
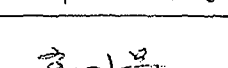
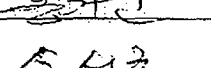



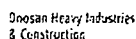
원자력품질관리부장

6/9/08

날 짜

 TRAINING SESSION COMPLETION RECORD					
COURSE TITLE : NQCP-300 Rev.22, PQAP-0701 REV.3, PQAP-1602 Rev.5, QCM-200 Ed.1 Rev.5 개정본				COURSE NO : N/A	
TRAINING DATE : 2008.06.09 ~ 2008.06.16				PAGE : 1 OF 6	
ATTENDEES					
NAME	DEPT (OR SECT)	POSITION	SELF STUDY DATE	HOUR	SIGNATURE
이성민	N&C	Engineer	6/9/08	16:00 ~ 17:00	이성민
이종호	"	"	6/9/08	17:10 ~ 18:00	이종호
차영태	"	Inspector	6/10/08	08:40 ~ 09:50	차영태
차영준	"	"	6/10/08	10:40 ~ 11:00	차영준
김성태	"	"	6/10/08	13:00 ~ 13:50	김성태
홍기철	"	"	6/10/08	14:00 ~ 14:50	홍기철
박영민	"	"	6/10/08	15:00 ~ 16:10	박영민
이성대	"	"	6/10/08	16:15 ~ 17:10	이성대
김응환	"	Engineer	6/12/08	08:00 ~ 08:40	김응환
최병현	"	Sec. mgr	6/12/2008	09:00 ~ 10:00	최병현
박종재	"	Inspector	6/13/08	08:00 ~ 09:00	박종재
최영석	"	"	"	09:00 ~ 10:00	최영석
이원만	"	Gen. mgr	"	10:00 ~ 11:00	이원만

 TRAINING SESSION COMPLETION RECORD					
COURSE TITLE : NQCP-300 Rev.22, PQAP-0701 REV.3, PQAP-1602 Rev.5, QCM-200 Ed.1 Rev.5 개정본					COURSE NO : N/A
TRAINING DATE : 2008.06.09 ~ 2008.06.16					PAGE : 3 OF 6
ATTENDEES					
NAME	DEPT (OR SECT)	POSITION	SELF STUDY DATE	HOUR	SIGNATURE
공강호	M&C	MGR	08.6.9	15:00~15:30	
김종호	"	QE	"	15:30~16:00	
김병진	"	"	"	16:00~16:30	
김유리	"	"	08.6.10	09:00~09:30	
김영태	"	QC	08.6.10	09:30~10:00	
나정식	"	"	08.6.10	10:00~10:30	
신종우	"	"	08.6.10	11:00~11:30	
홍성분	"	"	08.6.10	11:15~12:00	
이병채	"	"	08.6.10	13:00~13:30	
홍기문	"	"	08.6.10	14:00~14:30	
홍성훈	"	"	08.6.10	14:30~15:10	
전병수	"	QE	08.6.10	15:00~15:30	




Trial	Control	MCI	AD
1	85	75	65
2	88	78	68
3	90	80	70
4	92	82	72
5	95	85	75

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COURSE TITLE :	NQCP-300 Rev.22, PQAP-0701 REV.3, PQAP-1602 Rev.5, QCM-200 Ed.1 Rev.5 개정본	COURSE NO ;	N/A
TRAINING DATE :	2008.06.09 ~ 2008.06.16	PAGE :	6 OF 6

[illegible]

 Doosan Heavy Industries & Construction		CORRECTIVE ACTION REPORT(CAR) 시정 조치 보고서		CAR NO. : CAR_080052 보고서번호 Req Reply Date : 2008-05-30 회신요구일자
To : 원자력)원자력생산기술팀 수신처				
PJT No : NO6010 사업번호		Custome : Westinghouse Electric Company, 고객 LLC.		
Project : Sequoyah #2 RSG 사업명		NCR/ADR/CAR No : NCR_070643 불일치/감사/시정번호		
Conditions(상태) : This condition was pointed out during US NRC inspection at DOOSAN. For nonconformance number NCR_070643 and NCR_080026, determination of 10 CFR 21 applicability was not described in accordance with NQCP-1501 paragraph 6.4.14. "Report to 10 CFR 21 () Yes. (●) No"				
Recommended Corrective Action(시정조치방안) : 1. Perform the root cause analysis and take preventive actions of recurrence. 2. Investigate further for similar condition and take corrective actions.				
Prepared by : 이원만.LEE WON-MAN 08-05-28 작성자 원자력)원자력품질관리부 Date				
Cause and Corrective Action Response(원인 분석 및 시정 조치 계획) : 1. Root cause Engineer misunderstood NCR which not require customer approval dose not need to evaluate 10CFR21 applicability. (Insufficient understanding) 2. Corrective action 1) Re-train the related personnel 10CFR21 applicability. (MNE) 2) Revise "Recommended disposition sheet (NQCP-1501 Exhibit 3). (NQC) Refer to the attached CAR report. (RCA-CAR 080052)				
Responded by : 고경백.KO GYOUNG-BACK 08-05-29 Approved by : 김승원.KIM SUNG-WON 08-05-29 회신자 원자력)원자력생산기술팀 Date 승인자 원자력)원자력생산기술팀 Date				
<input checked="" type="checkbox"/> Approved 승인 <input type="checkbox"/> Disapproved 승인불가 <input type="checkbox"/> Approved with Comments 조건부 승인 Comments(주 석) :				
Reviewed by : 이원만.LEE WON-MAN 08-05-29 Approved by : 허남열.HUR NAM-YEOL 08-05-29 검토자 원자력)원자력품질관리부 Date 승인자 원자력)원자력품질관리부 Date				
Verification of Corrective Action 시정 조치 의 확 인 <input checked="" type="checkbox"/> Satisfactory 만족 <input type="checkbox"/> Required Re-Corrective Action(New CAR No. :)				
		Verified by : 이원만.LEE WON-MAN 08-06-13 승인자 원자력)원자력품질관리부 Date		
		Approved by : 박세완.PARK SE-WAN 08-06-13 승인자 원자력)원자력품질관리부 Date		

(품질보증-15200-012)

두산중공업(주)

(A4/복사용지)

Record No. RCA_CAR_080052

DOOSAN

Root Cause Analysis & Corrective Action

Subject: Inadequate Nonconformance Report Control

Date : 2008. 05. 28

**(NME) Team
Nuclear Business Group**

Approved by : 76-582 5/29/08
Reviewed by : 76-582 5/29/08
Prepared by : 76-582 5/28/08

Record No. RCA_CAR_080052

DOOSAN**1. Summary Description of the Problem(Including Sketch, Photo, When necessary)**

During US NRC inspection in DOOSAN, the following condition was pointed out by US NRC.

For nonconformance number NCR_070643 and NCR_080026, determination of 10 CFR 21 applicability was not evaluated in accordance with NQCP-1501 paragraph 6.4.14.

Example)

Prepared by : 이원만 LEE WON-MAN	07-12-18	과 직 SASOB G-3	불합수용 Crack
작성 자 원자력)원자력품질관리부	Date	수 정 1	불합수용 불량불합
Recommended Disposition : <input type="checkbox"/> Use-as-is <input type="checkbox"/> Repair <input checked="" type="checkbox"/> Rework <input type="checkbox"/> Reject <input type="checkbox"/> Others <input type="checkbox"/> Depreciation 1. 용접부위 가우징 및 사상으로 안전 제거하고, 재작업 직후 전 모서리 견착성 확인을 위하여 MT 수행함 Remove the welded area with gouging or grinding and then verify the soundness of base metal by MT exam before rework. 2. 재작업은 트래블러 NCR-070643에 따라서 수행함 것. Rework shall be performed in accordance with NCR-070643.			
Report to 10CFR21 : () Yes, () No			
Recommended by : 고영민 KO GYOUNG-MIN	07-12-18	Reviewed & Approved by : 김승원 KIM SUNG-WON	07-12-20
작성 자 원자력)원자력생산기술팀	Date	검 토 및 승 인 자 원자력)원자력생산기술팀	Date
Corrective Action Required : <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
시 작 조 치 발 요 CAR No.:			
Reviewed by : 이원만 LEE WON-MAN	07-12-20	Approved by : 박재환 PARK SE-HWAN	07-12-20
검 토 자 원자력)원자력품질관리부	Date	승 인 자 원자력)원자력품질관리부	Date
Accepted by :		S. Ruthin 12-20-07	
Customer		Date	
Verification of Final Disposition(최종 확인)		Verified by :	
<input checked="" type="checkbox"/> ACCEPTABLE <input type="checkbox"/> NOT ACCEPTABLE		최종 확인자 차영민 1/2/08 원자력)원자력품질관리부 Date 원자력)원자력품질관리부 Date	
Customer		Date	
Date		Date	
(품질보증-15100-016)		두산중공업(주)	
		(AM/백서용지)	

Record No. RCA_CAR_080052

DOOSAN

1. Summary Description of the Problem(Including Sketch, Photo, When necessary) – (Continue)

From the further investigation, similar condition was found on the following nonconformance report.

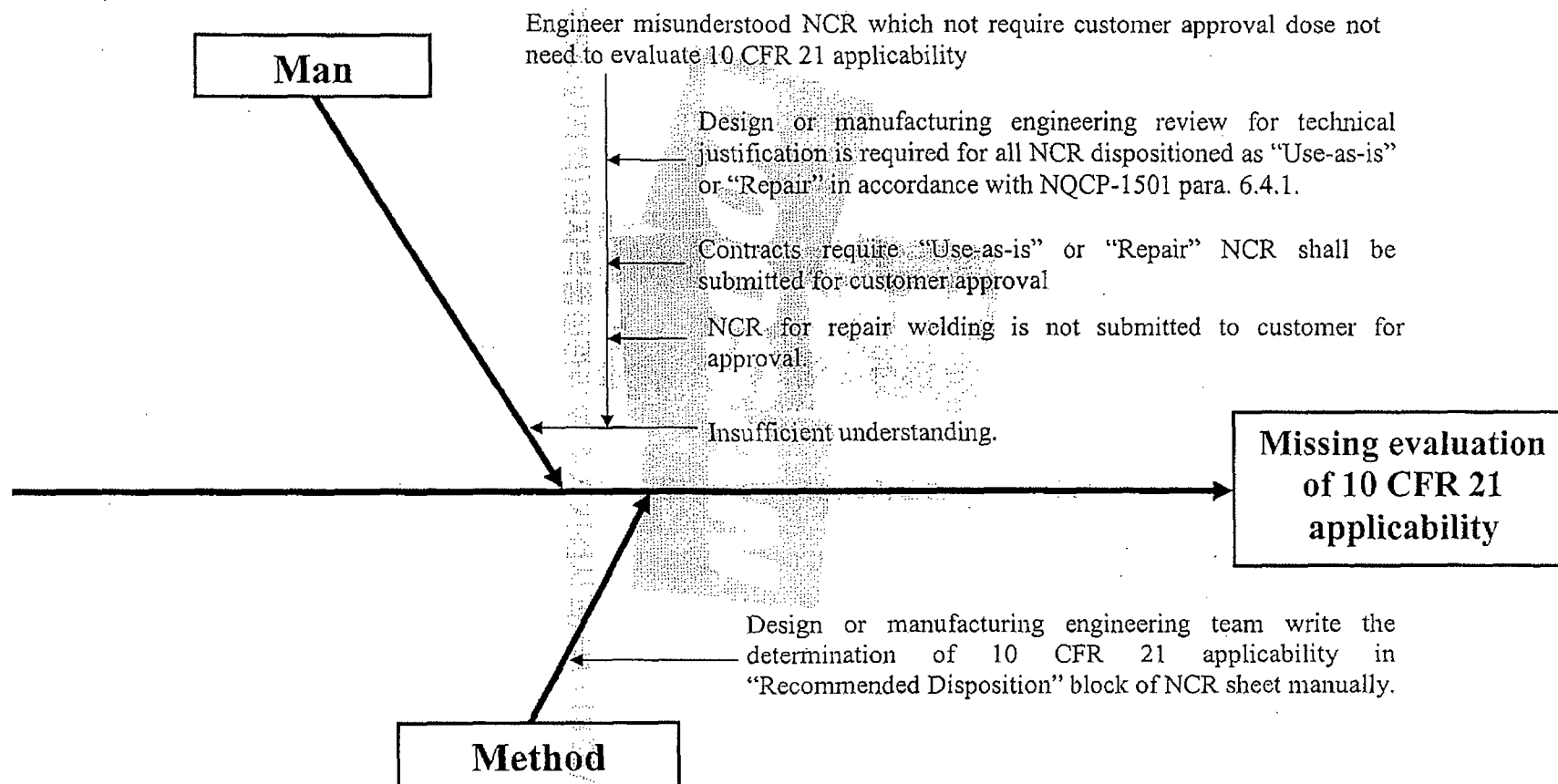
Doc. Num	Rev	Issue Date	Close Date	Project Number	Project Name
NCR_070482	0	2007-09-12	2007-10-24	N05004	Entergy RRVH Project
NCR_070261	0	2007-04-19	2007-04-20	N05004	Entergy RRVH Project
NCR_080026	0	2008-01-15	2008-01-16	N06010	Sequoyah #2 RSG
NCR_070643	0	2007-12-18	2008-01-09	N06010	Sequoyah #2 RSG

Evaluation of 10 CFR 21 applicability is required for the above nonconformance by manufacturing engineering team.

Record No. RCA_CAR_080052

DOOSAN

2. Root Cause Analysis



Record No. RCA_CAR_080052

DOOSAN**3. Corrective Action to prevent recurrence**

Root cause	Corrective action	Who When	Status after corrective action
Insufficient understanding of NQCP-1501 requirements	Re-train the related personnel - 10 CFR 21 applicability	MNE (2008.05.29)	Satisfactory
Determination of 10 CFR 21 applicability is not formatted in NCR	Revise "Recommended Disposition Sheet(NQCP-1501 Exhibit 3)" to add the determination of 10 CFR 21 applicability in "Evaluation block"	NQC (2008.05.29)	Satisfactory

Record No. RCA_CAR_080052

DOOSAN

4. Generic impact relative to other products, services, procedures, process or systems

None

(10 CFR 21 applicability was determined for all nonconformance report. And any nonconformance report need not to reported to US NRC 10 CFR 21.)

교육 훈련 계획

Training & Indoctrination Schedule

Schedule No: N/A


작성 일자 : 2008.05.28

1. 교육 교과목 : NQCP-1501 REV.9 DRAFT(NCR 절차서)
2. 교육 대상자 : MNE Team Engineer
3. 교육 일시 : 2008.05.28
4. 교육 강사 : 고경백 책임
5. 교육 장소 : 회의실
6. 교육 방법 : 강의식

승인자 :

원자력생산기술팀장


날 짜

 Doosan Heavy Industries & Construction	NUCLEAR BG QUALITY CONTROL PROCEDURE NQCP-300		QCP NO : NQCP-1501 REV NO : 9 DATE : 05/28/2008 PAGE : 1 OF 21
	Control and Correction of Nonconforming Items and Activities		
ASME III / KEPIC MN	ISO 9001	ASME VIII / KEPIC MG	

1.0	Preface
2.0	Scope
3.0	Application
4.0	References
5.0	General
6.0	Procedure
7.0	Documentation
8.0	Exhibits

S. Y. Park	S. W. Park	G. K. Kim
5. 28. 08	5/28/08	May. 28. 2008
NAME	NAME	NAME
DATE	DATE	DATE
Prepared by Nuclear Quality Control Dept.	Reviewed & Approved by Nuclear Quality Control Dept. Gen. Mgr.	Reviewed & Approved by QA Team Gen. Mgr.

Important Note : Printed copies of this Procedure may be used only for reference.


 Doosan Heavy Industries & Construction	NUCLEAR BG QUALITY CONTROL PROCEDURE NQCP-300	QCP NO : NQCP-1501 REV NO : 9 DATE : 05/28/2008 PAGE : 2 OF 21
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Control and Correction of Nonconforming Items and Activities

Revision History(개정이력)

No.	Date	Revision	Prepared by	Reviewed / Approved by	
0	2005.07.26	First issue	S.Y.Park	J.K.Seo	S.K.Kim
1	2005.10.05	- 6.2.3 : NCR Hold Tag Remove - 6.3.3 : Vendor NCR issue - 6.3.5 : NCR Numbering System - NCR form	S.Y.Park	J.K.Seo	S.K.Kim
2	2006.01.25	- 6.4.14: Revise to add 10 CFR 21 applicability	S.Y.Park	J.K.Seo	S.K.Kim
3	2006.08.25	- Added OICR : 6.2.4 - 6.4.14: Revise to change method recorded "10 CFR 21 applicability" - 6.2.5.1 & 6.5.1 Revise to change approved authority of Conditional Release	S.Y.Park	J.K.Seo	S.K.Kim
4	2007.04.10	- 6.2.5.1 Deletion - 5.2 & 5.3 Addition - 6.2.3, 6.5.1 through 6.5.6 Conditional release requirement change	S.Y.Park	S.W.Park	S.K.Kim
5	2007.09.03	- 6.4.1 : Delete "In the case of Repair of welding Defect is not required Design engineering review for technical justification" - 6.4.3.2): Add "Manufacturing Engineering Dept" * KINS comments during KHNP Audit	Y.C.Kim	S.W.Park	S.K.Kim
6	2007.09.13	a term Change on Korean Version only Para 3.1 & 6.4.1 Has not effect on English Version.	S.Y.Park	S.W.Park	S.K.Kim
7	2008.04.16	6.3.2 NCR => Nonconforming condition 6.4.14 NPQAP-1602 => PQAP-1602 6.5.3, 6.5.4 & 6.5.5 to apply only KHNP PROJECT Exhibit 1,4,6 change Exhibit 7 NCR List Add	S.Y.Park	S.W.Park	S.K.Kim
8	2008.05.16	6.7 Root cause analysis requirement add	S.Y.Park	S.W.Park	S.K.Kim
9	2008.05.28	- 6.4.14: Revise to change method recorded "10 CFR 21 applicability"	S.Y.Park	S.W.Park	S.K.Kim

Important Note : Printed copies of this Procedure may be used only for reference.

 Doosan Heavy Industries & Construction	NUCLEAR BG QUALITY CONTROL PROCEDURE NQCP-300	QCPNO : NQCP-1501 REVNO : 9 DATE : 05/28/2008 PAGE : 3 OF 21
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Control and Correction of Nonconforming Items and Activities

1.0 PREFACE

- 1.1 This Nuclear BG Quality Control Procedure (NQCP) is established by QC Department under the direction and authority of the Head of Nuclear BG.

2.0 SCOPE

- 2.1 This procedure provides the details describing the authority, responsibilities and prescribes the methods to be implemented by Doosan Heavy Industries & Construction co., Ltd. (hereafter "DOOSAN") to identify, control and correct nonconforming conditions concerning items, materials, services and quality affecting operations and activities covered by the Quality Program Manuals referenced in this procedure.

3.0 APPLICATION

- 3.1 This procedure shall be applied to implement requirements of the Quality Manuals identified in QCP-0102 Appendix A and applicable Codes and Standards listed in this procedure Table 1.


4.0 REFERENCES

- 4.1 This procedure shall be maintained in accordance with the requirements of the applicable documents referenced in QCP-0104 Appendix and in this procedure Table 1.

TABLE 1 : REFERENCES

- 1) ASME Boiler and Pressure Vessel Code, Section III, NCA- 3800
- 2) ASME Boiler and Pressure Vessel Code, Section III, NCA- 4000
- 3) ASME Boiler and Pressure Vessel Code, Section VIII-1, Appendix 10
- 4) ASME Nuclear Components, NQA-1, Basic and Supplementary Requirements.
- 5) International Standard ISO 9001 : 2000
- 6) KEPIC QA, MN, EN, SN, MG
- 7) Product liability act

Important Note : Printed copies of this Procedure may be used only for reference.

 Doosan Heavy Industries & Construction	NUCLEAR BG QUALITY CONTROL PROCEDURE NQCP-300	QCP NO: NQCP-1501 REV NO: 9 DATE : 05/28/2008 PAGE : 4 OF 21
Control and Correction of Nonconforming Items and Activities		

5.0 GENERAL


- 5.1 This procedure describes the requirements and responsibilities for identification, reporting, documentation, segregation, disposition, and correction of nonconforming items, materials, processes, services and activities affecting quality in order to prevent inadvertent use of affected items and/or services.
- 5.2 These documents (Design specification, Manufacturing Specification, Drawing) of Items quality characteristic interact with technical requirements non conforming items shall be issued non conformance report.
- 5.3 For convenient of Procedure preparation these non conformance objects are described as a general term Non conformance item.

6.0 PROCEDURE

6.1 Responsibilities

- 6.1.1 The responsible QC Dept and NDE Dept is responsible for the generation and processing of Nonconformance Report (NCR, Exhibit 2) resulting from deviations identified during manufacturing at the Doosan Heavy Industries & Construction Company.
- 6.1.2 The responsible QC Dept is responsible for the generation and processing of NCR resulting from vendor nonconformances.
- 6.1.3 The responsible Design Engineering Dept is responsible for disposition of DOOSAN and review and approval of DOOSAN issued NCR resulting from vendor nonconformances that is technical in nature or deviates from the design contract and/or Code requirements.
- 6.1.4 The Casting & Forging Engineering (CFE) Dept is responsible for the evaluation of nonconforming condition and the determination of proposed disposition for the casting & forging materials.
- 6.1.5 Other Dept's shall be involved in the disposition of NCR when such a disposition is within their specific area of expertise and responsibility.

Important Note : Printed copies of this Procedure may be used only for reference.

 Doosan Heavy Industries & Construction	NUCLEAR BG QUALITY CONTROL PROCEDURE NQCP-300	QCP NO : NQCP-1501 REV NO : 9 DATE : 05/28/2008 PAGE : 5 OF 21
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Control and Correction of Nonconforming Items and Activities

6.1.6 Vendors are responsible for the generation and processing of NCR in accordance with their DOOSAN approved QA Program and PO/Contract requirements. They are also responsible for providing appropriate corrective action for DOOSAN generated NCR.

6.1.7 For ASME or KEPIC MN & SN items the NCR dispositions and implemented results shall be presented to the AI(ANI) for his review and acceptance. For casting and forging materials manufactured by Doosan the AI(ANI) acceptance of the results of the NCR dispositions is not required except when defects have been removed, provided the depth of the repair cavity exceeds one-third the nominal thickness.

6.2 Identification and segregation

6.2.1 Items determined to be nonconforming shall be identified by the responsible QC Dept inspection personnel or NDE examiner (hereafter called "QC personnel") performing the applicable operation. A Hold Label (Exhibit 1) shall be prepared and attached to the nonconforming item or associated work package or container except as indicated in 6.2.2 below. The Hold Label shall be prepared by the responsible QC Dept personnel and shall include the following information.


- 1) Subproject Order number;
- 2) Item name;
- 3) NCR number;
- 4) Applicable Traveller number;
- 5) Description of nonconformance;
- 6) Name of QC inspector who attached label; and
- 7) Date.

6.2.2 When it is not practical to attach the Hold label directly to the item, the Hold label shall be attached to the items container or package or placed with the Traveller, etc., as appropriate.

6.2.3 When the proposed NCR disposition is accepted by the ANI, the responsible QC inspection personnel or NDE examiner shall remove a Hold Label from the item, its container or the Traveller. The conditional release of 6.5 paragraph Hold Label should be maintained

6.2.4 The responsible QC personnel shall then initiate a NCR for the identified nonconformance and record the NCR number on the Traveller, On Truck Inspection Checklist/Report(OICR) or Receiving Inspection Checklist/Report (RICR) or Source Inspection Record, as appropriate.

Important Note : Printed copies of this Procedure may be used only for reference.

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Control and Correction of Nonconforming Items and Activities

The responsible QC personnel shall then notify the organizations which are affected by the nonconformance.

6.2.5 Nonconforming items shall be segregated from acceptable items by the responsible DOOSAN shop personnel. Further processing of the item shall be stopped pending disposition of the NCR.

6.2.5.1 In certain circumstances the responsible QC Section Manager may authorize that a nonconforming item be approved to be processed further prior to dispositioning the NCR. In these cases the item a Conditional Release sticker (Exhibit 3) shall be prepared by the QC Dept and the item shall be under full recall control, in accordance with paragraph 6.5 of this procedure.

6.2.6 When segregation of the nonconforming item is not practical or impossible due to physical conditions such as size, weight or access limitation, the area immediately surrounding the nonconforming item shall be clearly identified by markings, barriers, ropes or other distinguishable means.


6.2.7 Individuals other than QC personnel shall notify QC Dept of nonconforming conditions at anytime during the receipt, manufacture, storage and shipping of items to investigate the condition and proceed in accordance with this procedure. The General Manager shall encourage their employees to activate the notification of nonconformance by indoctrination. Upon notification of the existence of nonconforming conditions the responsible QC Dept personnel shall investigate the condition and if validated as nonconforming proceed to take the actions specified in paragraphs 6.2.1 through 6.2.5 above.

6.2.8 Items found to be nonconforming at a vendor's facility by the QC personnel during source verification shall be identified to the vendor upon discovery. The vendor shall take appropriate action to segregate the nonconforming item and determine and implement corrective measures in accordance with the vendor's QA Manual as approved by DOOSAN and the contract.

6.3 Documentation

6.3.1 The QC personnel who identified the nonconforming condition shall document the details of the deviation on the DOOSAN NCR and forward it to the Quality engineer as appropriate for resolution.

Important Note : Printed copies of this Procedure may be used only for reference.

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- 6.3.2 The nonconforming condition identified by the QC personnel during source verification activities shall be transmitted to the vendor who establishes his own NCR in accordance with the DOOSAN approved QA Program.
- 6.3.3 In the case of Vendor do not Issue a NCR for non conforming condition, DOOSAN NQC can be issued NCR
- 6.3.4 The responsible QC Dept shall maintain the master NCR log to indicate current status of NCRs initiated.
- 6.3.5 NCR number is automatically registered in electrical system, Numbering system is as below.

N	C	R	0	5	0	0	0	1
---	---	---	---	---	---	---	---	---

Category of Document Year Serial No

6.4 Disposition


- 6.4.1 Upon receipt of the NCR, the responsible Quality engineer shall determine the organization with responsibility for evaluation and disposition. Design engineering or Manufacturing engineering review for technical justification shall be obtained for all NCR dispositioned as "Use-as-is" or "Repair. Technical justification shall be directly recorded on the NCR or documented to maintain traceability of applicable NCR. Technical justification of nuclear PJT shall be recorded on Recommended Disposition Sheet (Exhibit 3)

- 6.4.2 If the Quality engineer determines that the item can be brought into conformance by completion of unfinished work or by correction and the design of the item is not affected, then the NCR shall be transmitted to the responsible Manufacturing Engineering (ME) Dept for disposition. If the NCR is dispositioned "Rework" the responsible ME Dept. shall provide the implementation details on the NCR and return it to the Department responsible for implementation via the Quality engineer.

Note: "Rework" dispositions shall not be used to disposition nonconformances to ASME or KEPIC MN, EN & SN Code requirements.

"Depreciation" dispositions shall not be applied to disposition nonconformances to Nuclear BG.

Important Note : Printed copies of this Procedure may be used only for reference.

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Control and Correction of Nonconforming Items and Activities

6.4.3 When design engineering action for manufactured items (including casting and forging materials manufactured by Doosan) is required, the Quality engineer shall submit the NCR to the responsible Design Dept for disposition. If the responsible Department disposes the NCR "Use-As-Is", or "Repair" for manufactured items the following requirements shall be followed :

1) Use-As-Is

If the NCR is dispositioned "Use-As-Is", the Design Dept shall provide a technical justification and disposition instructions by the responsible Dept.

2) Repair

If the NCR is dispositioned "Repair" the Design Dept or Manufacturing engineering Dept shall provide disposition instructions with technical justification and return the NCR to the responsible ME Dept via Quality engineer.

Note) For casting and forging materials manufactured by Doosan the NCR initiated by responsible QC Dept prior to certifying the CMTR which requires weld repair by the Nuclear Business Group shall be proceeded as follows :

(1) "Repairs" dispositions shall be recommended, reviewed and approved by the responsible Design Dept. The Design Dept shall transfer the NCR to the responsible Manufacturing Engineering Dept via Quality engineer.

(2) The responsible Manufacturing Engineering Dept shall prepare the documents required by the Quality Assurance Manual and Quality Control Procedure such as repair TRV, WPS, WI, etc..

(3) All approved dispositions shall be finally reviewed by the NQC Dept and approved by the Dept General Manager. The NQC Dept shall request the responsible Dept to implement NCR disposition in accordance with the Quality Assurance Manual and this Quality Control Procedure.


(4) After the disposition has been satisfactorily implemented and the weld repair accepted, the NQC Dept shall close out the NCR and transfer the NCR with supporting documents to the CFQC Dept.

(5) The CFQC Dept shall review the results of the NCR dispositions prior to certifying the CMTR.

3) Others

If the NCR dispositioned "Others" the Design Dept shall provide disposition instructions with technical justification. "Others" dispositions shall not be used to disposition nonconformances to ASME or KEPIC MN, EN & SN Code requirements except the casting and forging materials manufactured by Doosan.

Important Note : Printed copies of this Procedure may be used only for reference.

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Control and Correction of Nonconforming Items and Activities


Note) For casting and forging materials manufactured by Doosan the NCR initiated by responsible QC Dept after certifying the CMTR which requires weld repair by Nuclear Business Group shall be proceeded as follows ;

- (1) "Others" dispositions shall be recommended, reviewed and approved by the responsible Design Dept.
- (2) All approved dispositions shall be finally reviewed by the CFQC Dept and approved by the Dept General Manager. The CFQC Dept shall close out the NCR prior to certifying the CMTR.
- (3) Upon receipt the nonconforming materials with the CMTR, the NQC Dept shall initiate the NCR and request responsible Dept to propose and implement the disposition in accordance with the Quality Assurance Manual and this Quality Control Procedure.
- (4) After the disposition has been satisfactorily implemented and the materials accepted, the NQC Dept shall certify the CMTR.

6.4.4 For casting and forging items if the CFE Dept dispositions the NCR Use-As-Is, Repair/Rework, Reject (or Scrap/Return to vendor, hereinafter referred to as Reject) the following requirements shall be followed :

- 1) Use-As-Is (Concession)
If the NCR is dispositioned "Use-As-Is" the CFE Dept shall provide a technical justification and the NCR shall be submitted to the Customer (or responsible Design Dept, hereinafter referred to as the Customer) for approval. If the NCR is written against a deviation of a more stringent casting & forging organization requirement but complies with the Customer requirements the NCR does not require Customer approval.
- 2) Repair/Rework
If the NCR is dispositioned "Repair/Rework" the CFE Dept shall provide disposition instructions with technical justification and if required by contract submit the NCR to the Customer for approval.
- 3) Reject
If the NCR is dispositioned "Reject" the inspection personnel shall replace the HOLD Label with a REJECTED label and remove the item from the production or receiving inspection area for disposal or transport to the vendor.
- 4) Others
If the NCR dispositioned "Others" the CFE Dept shall provide disposition instructions with technical justification.


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- 6.4.5 If the NCR is dispositioned "Reject" the inspection personnel shall replace the "HOLD" Label with a "REJECTED" Label (Exhibit 4) and remove the item from the production or receiving inspection area for disposal or transport to the vendor.
- 6.4.6 All recommended, reviewed and approved dispositions of nonconformances shall be finally reviewed by the Quality engineer and approved by the responsible QC Dept General Manager to assure compliance with Customer and Code requirements. All DOOSAN and DOOSAN vendor's NCR affecting Code construction shall be submitted by the Quality engineer to the AI(ANI) for his review and concurrence of the proposed disposition in case of ASME or KEPIC MN & SN items.
- 6.4.7 Upon the receipt of the dispositioned NCR, the responsible Manufacturing Engineer shall prepare the NCR Extension Sheet (Exhibit 5) or additional Traveller in accordance with the final approved disposition on the NCR.
- 6.4.8 The approved NCR disposition shall be implemented by the applicable shop personnel using the NCR including NCR Extension Sheet and/or Traveller provided by the Manufacturing Engineer.
- 6.4.9 Repaired items shall be re-examined and re-inspected in accordance with applicable procedures using the original acceptance criteria unless the disposition instructions have established alternate acceptance criteria that comply with the Code and/or Customer requirements.
- 6.4.10 Nonconforming items shall be returned to the manufacturing sequence, as described on the Traveller only after the NCR disposition has been implemented and the items accepted by the applicable QC Dept and the AI(ANI) for the fabrication of ASME or KEPIC MN & SN items. The responsible QC Dept General Manager shall make a determination whether an appropriate corrective action in accordance with QCP-1602 is required. This determination shall be shown on the NCR.
- 6.4.11 Vendor NCRs shall be dispositioned by the vendor. If the dispositions will result in deviations from design specification and/or contract requirements, such dispositions shall be submitted to the responsible DOOSAN Design Dept or CFE Dept (for casting & forging items) for review and approval. This requirement shall be included in the contract with vendor.

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6.4.12 The Quality engineer shall be responsible for the review and acceptance of vendor nonconformance dispositions not included in the above para. 6.4.11. Other Departments or Sections of DOOSAN shall review and accept the vendor's dispositions as deemed appropriate by the Quality engineer.

6.4.13 The vendor shall be responsible to assure that dispositions meet the requirements of the Doosan Heavy Industries & Construction co., Ltd. procurement documents. DOOSAN acceptance of dispositions does not relieve the vendor of this responsibility.

6.4.14 Determination of 10 CFR 21 Applicability

For the NQC Dept generated NCR related to the nuclear items which are supplied to U.S.A the following requirements shall be applied.

- a) The design engineering team which is requested the review for technical justification as per paragraph 6.4.1 shall determine the identified condition represents a 'substantial safety hazard' and describe the results on the NCR or Recommended Disposition Sheet(Exhibit 3) like "Report to 10CFR21 () Yes, () No".
- b) If "Report to 10 CFR 21" is required, it shall be processed in accordance with PQAP-1602.
- c) Recommended Disposition Sheet(Exhibit 3) shall be attached to all NCR.

6.5 Conditional release (Urgent release)


6.5.1 Non conformance condition could be applied conditional release at the limit of it does not affecting quality on the urgent or required condition.

6.5.1.1 Condition release will not prevent the investigation of and proper dispositioning and resolution of the nonconforming condition.

6.5.1.2 In no case shall a nonconforming item be allowed to proceed through testing and/or final inspection.

6.5.2 "Conditional release"(exhibit 4) sticker shall be attached on the items with Hold Label of non conforming report attached condition

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- 6.5.3 "Conditional release" shall be described on disposition column of non conformance report by applicable Design team or manufacturing engineering team. For conditional release Disposition could be "others" and Technical evaluation review is not required by Design team.
- 6.5.4 The disposition review and approval for conditional release shall be same process with non conforming report.
- 6.5.5 An occasion of final disposition confirmed after conditional release by 6.5.3 & 6.5.4 paragraph, the final non conforming report re-issued with revision. Articles of conditional release could be chase and identify on revised non conforming report with the summary of contents of old non conforming report revision number.
- 6.5.6 If a conditional release decision is made to proceed with fabrication operations on a nonconforming item, the responsible QC personnel shall prepare the "Conditional Release" sticker and submit it to the responsible QC Dept Section Manager for approval. In case of ASME or KEPIC MN & SN items, the concurrence of the AI(ANI) shall be obtained before proceeding the 'Conditional Release'. The "Conditional Release" sticker shall identify the Traveller and operation number (NCR No. for receiving inspection) at which the nonconformance was found and the Traveller and operation number beyond which manufacturing operations must not proceed. The conditional release operation(s) shall be indicated by "Conditional Release" on the Traveller or RICR, by the responsible QC Dept. The "Conditional Release" sticker shall be attached over some portion of the Hold label which will not cover any information contained thereon.

This paragraph (6.5.3, 6.5.4 & 6.5.5) shall be apply only KHNP project

- 6.6 Verification
- 6.6.1 If designated by the customer, Customer's Witness/Hold/Review points concerning the disposition implementation shall be identified on the Traveller. The Customer shall be notified of when the selected points will be ready in accordance with requirements of the contract.

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6.6.2 After completion of the disposition work, the responsible QC personnel shall verify that the disposition requirements have been satisfactorily met, then sign and date on the NCR to indicate acceptance. For ASME or KEPIC MN & SN items the acceptance of the AI(ANI) shall also be obtained. After verification of acceptance the responsible QC Dept shall close out the NCR in the NCR Log.

6.7 Root Cause Analysis (RCA)

6.7.1 If Nonconformance Report is issued, the responsible QC personnel shall forward form of Root Cause Analysis prepared electronic system to the responsible organization.
In the case of issuing Corrective Action Report, Root Cause Analysis is not performed.


6.7.2 The responsible organization for implementing of the cause analysis and prevent recurrence shall prepare a Root Cause Analysis and return it to the responsible QC personnel.

6.7.3 After receiving the response of the Root Cause Analysis sheet, the responsible QC personnel shall review the response and evaluate the proposed cause and corrective action. If is unacceptable, it shall be returned to the responsible organization and requested more appropriate corrective action. if acceptable, the responsible QC personnel shall approve Root Cause Analysis on electronic system.

7.0 DOCUMENTATION

7.1 The completed NCR and associated documentation records shall be controlled in accordance with QCP-1701 and as required by the applicable Code and QA Program and contract requirements.

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8.0 EXHIBITS

- Exhibit 1 : "HOLD" Label
- Exhibit 2 : Nonconformance Report (NCR)
- Exhibit 3 : Recommended Disposition Sheet
- Exhibit 4 : "Conditional Release" Sticker
- Exhibit 5 : "REJECTED" Label
- Exhibit 6 : NCR Extension Sheet
- Exhibit 7 : NCR List



2008-08-12 19:54/원자력)원자력품질관리부 주기기감사과/H111856/이완만

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Exhibit 1 : "HOLD" label

HOLD (보류)	
PROJECT NO (공사번호) _____	
PROJECT NAME (사업명) _____	
ITEM NAME (부품명) _____	NCR NO _____
APPLICABLE TRAVELLER (해당공정번호) _____	
GENERAL DESCRIPTION (불량내용) _____	

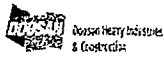
ATTACHED BY _____	DATE (날짜) _____

TO BE REMOVED BY QC PERSONNEL ONLY	

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Exhibit 2 : Nonconformance Report (NCR)


		NONCONFORMANCE REPORT(NCR) 부 적 합 보 고 서		NCR NO : Rev No : Date Found : 발견일자	
Project : 사업명		DWG.No. : 도면번호		Rev. : 개정	
PJT No : 공사번호		TRV. No. : 트래블러번호		Rev. : 개정	
Item No./Name : 품목번호/품목명		Oper. No. : 공정번호			
Customer/Vendor : 고객/업체		RICR. NO. : 수검번호			
Nonconforming Condition(부적합내용) : Attach(유첨) <input type="checkbox"/> Yes(유) <input type="checkbox"/> No(무)					
Prepared by : 작성 자		Date		재 질 수 량	불량유형 불량원인
Recommended Disposition : <input type="checkbox"/> Use-as-is <input type="checkbox"/> Repair <input type="checkbox"/> Rework <input type="checkbox"/> Reject <input type="checkbox"/> Others <input type="checkbox"/> Depreciation					
Recommended by : 제 안 자		Date		Reviewed & Approved by : 검 토 및 승 인 자	
				Date	
Corrective Action Required : <input type="checkbox"/> Yes <input type="checkbox"/> No 사 정 조 치 필 요 CAR No					
Reviewed by : 검 토 자		Date		Approved by : 승 인 자	
				Date	
Accepted by : 수 락 자					
Customer		Date		ANI / AI	
				Date	
Verification of Final Disposition(최종확인) <input type="checkbox"/> ACCEPTABLE 합 격 <input type="checkbox"/> NOT ACCEPTABLE 불 합 격		Verified by : 최종확인자			
		Customer		Date	
				ANI/NI	
				Date	

(품질보증-15100-016) 두산중공업(주) (A4/복사용지)

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Exhibit 3 : Recommended Disposition Sheet

 Doosan Heavy Industries & Construction		Recommended Disposition Sheet 기술검토서 양식	
Project :		NCR No. : Rev. No. :	
Component :		Item :	
<u>Description</u>			
Evaluation <input type="checkbox"/> Code Violation : <input type="checkbox"/> Spec. Violation : Report to 10 CFR 21 <input type="checkbox"/> Yes <input type="checkbox"/> No			
<u>Recommended Disposition</u>			
Attachment :			
Prepared by :		Reviewed by :	

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Exhibit 4 : "Conditional Release" sticker

 <div> <div>CONDITIONAL RELEASE</div> <div>조 건 부 해 제</div> </div>	
Project No 공사번호	Project Name 사 업 명
ITEM 제품	NCR No.
TRV No 트래블러번호	Operation No 작 업 번 호
May Process only 작업허용 범위 from Operation No. _____ of the TRV No. _____ 로 부터 to Operation No. _____ of the TRV No. _____ 까지인	
Remarks 비 고 <div>DOOSAN</div>	
Prepared by 작 성 자	Approved by 승 인 자
QC Sect Date	QC Mgr Date

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Exhibit 5 : "REJECTED" label

REJECTED (수정, 반품, 폐기)	
NCR NO _____	
PROJECT NAME (공사명) _____	
DESCRIPTION (불량내용) _____	

INSPECTOR(검사원)	DATE(날짜)
TO BE REMOVED BY QC ONLY	

BASE : RED
LETTER : BLACK

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Exhibit 6 : NCR Extension Sheet



두산중공업

PJT NAME: 사업명		PJT NO : 공사번호		TRV NO. : 트래블러번호			Page of 페이지 의		
OPER NO. 공정 번호	RESPON. DEPT/SECT 담당부서 /과	OPERATION DESCRIPTION 작업내용	REF. DOC. NO. 적용문서번호	HEAT/LOT RECORD NO. 자제식별 기록서번호	FOREMAN 작업반장	NQC PERS 품질검사원	ANI /AI 원자력/ 승인검사관	CUSTOMER 고객	REMARKS 비고


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Exhibit 7 : NCR List

Project No. : 공사번호			NONCONFORMANCE REPORT LOG 불 일 치 보 고 서 목 록				Log No. :	
Project : 사업명								
No. 순 위	NCR No. 보고서번호	Open Date 개 시 일	Nonconformance Description / Remarks 불 일 치 내 용 / 비 고	TRV No. 트레블라 번 호	RICR No. 수검보고서 번 호	Acceptance Status 수 락 현 황		CAR 발행 여부
		Close Date 완 료 일				ANI 원자력검사관	Customer 고 객	


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 Doosan Heavy Industries & Construction		NONCONFORMANCE REPORT(NCR) 부 적 합 보 고 서		NCR No. : NCR_070261 Rev No. : 0 Date Found : 2007-04-19 발견일자	
Project : Entergy RRVH Project 사업명		DWG. No. : N/A 도면번호		Rev. : 개정	
PJT No : N05004 공사번호		TRV. No. : N/A 트래블러번호		Rev. : 개정	
Item No./Name : PJ03010017-000100 / GTAW WIRE 품목번호/품목명		Oper. No. : N/A 공정번호			
Customer/Vendor : Entergy Operation Inc.(AR, USA) / 고객 / 업체 SPECIAL METALS PACIFIC PTE LTD._F2428		RICR. NO. : 2006033976-220003786 수검번호			
Nonconforming Condition(부적합내용) : Attach(유청) <input type="checkbox"/> Yes(유) <input checked="" type="checkbox"/> No(무) 1. During reviewing the vendor's CMTR(Special Metals), it was found that Voltage for chemical analysis of diluted weld deposit deviate from Doosan purchase specification requirement. - Purchase specification(EP5-T43-133 Rev.B) : 16 ~ 18 Voltage - CMTR(06627402 rev 2) : 11.6 Voltage 2. Doosan purchase specification require to mark the classification number, size and heat number for each welding rod. However, size and heat number are not marked on each welding rod. - Actual marking status : INCONEL 52M ERNiCrFe-7A ※ Classification and specification number, trade designation, heat number, size are marked on each unit package of welding rod.					
Prepared by : 이원만. LEE WON-MAN 작성자 원자력)원자력품질관리부		07-04-19 Date		재질 SFA-5.14 ERNiCrFe-7A 수량 200 물량유형 물량원인 자재성적서 작성요류 업체공급자재	
Recommended Disposition : <input checked="" type="checkbox"/> Use-as-is <input type="checkbox"/> Repair <input type="checkbox"/> Rework <input type="checkbox"/> Reject <input type="checkbox"/> Others 1. Recommended disposition : Use as is. 2. Reason : 1) Welding voltage It can be different due to welding power source brand. And also WPS is available within 9-18V. 2) Marking Marking on the surface of welding rod was to verify welding rod easily but since heat and size was marked on the surface of each container, it can be verified heat and size before issuing welding filler material at the crib.					
Recommended by : 김광일. 제안자 원자력)원자력생산기술팀		07-04-20 Date		Reviewed & Approved by : 김승원. 검토 및 승인자 원자력)원자력생산기술팀 07-04-20 Date	
Corrective Action Required : <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 시정조치 필요 CAR No. :					
Reviewed by : 이원만. LEE WON-MAN 검토자 원자력)원자력품질관리부		07-04-20 Date		Approved by : 박세완. PARK SE-WAN 승인자 원자력)원자력품질관리부 07-04-20 Date	
Accepted by : 수락자 Customer Date ANI/AI					
Verification of Final Disposition(최종확인) <input checked="" type="checkbox"/> ACCEPTABLE <input type="checkbox"/> NOT ACCEPTABLE		Verified by : 최종 확인자 원자력)원자력품질관리부 Date 4/20/07 Customer Date ANI/AI Date			

(품질보증-15100-016)

두산중공업(주)


(A4/복사용지)

 Doosan Heavy Industries & Construction		NONCONFORMANCE REPORT(NCR) 부 적 합 보 고 서		NCR No. : NCR_080026 Rev No. : 0 Date Found : 2008-01-14 발견일자	
Project : Sequoyah #2 RSG 사업명		DWG. No. : D-SB-21141-M02 (2/2) 도면번호		Rev. : 1 개정	
PJT No : N06010 공사번호		TRV. No. : 100422725 트래블러번호		Rev. : 1 개정	
Item No./Name : N060101-SB21141M02-0201B / LOWER 품목번호/품목명 SHELL ASSY		Oper. No. : 760 / INSPECTION 공정번호			
Customer/Vendor : Westinghouse Electric Company, LLC. / 고객 / 업체 N/A		RICR. NO. : N/A 수검번호			
Nonconforming Condition(부적합내용) : Attach(유첨) <input type="checkbox"/> Yes(유) <input checked="" type="checkbox"/> No(무) Support Lug(1ea)와 Lowershell 용접 후 후열유지 시간기록이 WPS 요건 대비 부족함. (For the support lug(1ea) to Lowershell welding, the extended preheat time was not recorded in accordance with WPS requirement.) - Joint No. 203-41H - WPS(A-M-0103-137 Rev.5) requirement : Min. 4 hours - Actual recorded time : 2 hours 54 minutes * 2B Set					
Prepared by : 이원만.LEE WON-MAN		08-01-15		재 질 SA516-Gr 70	
작성 자 원자력)원자력품질관리부		Date		수량 1	
불량유형		예열 및 후열		불량원인	
작업지침 미준수					
Recommended Disposition : <input checked="" type="checkbox"/> Use-as-is <input type="checkbox"/> Repair <input type="checkbox"/> Rework <input type="checkbox"/> Reject <input type="checkbox"/> Others <input type="checkbox"/> Depreciation 후열의 목적은 용접후 수소방출로 지연 균열을 방지하기 위한 것으로, 후열이 WPS의 조건에 따라 1시간 부족하지만 수행되었고, 용접 수행후 MT 수행한 결과, 용접 건전성이 확인되었기에 현상사용함. The purpose of extended preheat is to prevent any delayed cracking by releasing hydrogen in the weldment after welding. Use as is since extended preheat was short around 1 hr but performed and as the result of MT examination (Report No. : M080111-021-001) weld soundness was verified.					
Report to 10 CFR21 () Yes, (✓) No S. W. C. 8/16/08					
Recommended by : 고경백.KO GYOUNG-BACK		08-01-15		Reviewed & Approved by : 김승원.KIM SUNG-WON	
제 안 자 원자력)원자력생산기술팀		Date		검 토 및 승 인 자 원자력)원자력생산기술팀	
				Date	
Corrective Action Required : <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 시 정 조 차 필 요 CAR No.:					
Reviewed by : 이원만.LEE WON-MAN		08-01-16		Approved by : 박세완.PARK SE-WAN	
검 토 자 원자력)원자력품질관리부		Date		승 인 자 원자력)원자력품질관리부	
				Date	
Accepted by : 수 력 자 Customer Date ANI/AI 1-16-08					
Verification of Final Disposition(최종확인) <input checked="" type="checkbox"/> ACCEPTABLE 합 격 <input type="checkbox"/> NOT ACCEPTABLE 불 합 격		Verified by : 최종 확인자 원자력)원자력품질관리부 1/16/08 Customer Date ANI/AI 1-16-08			

(품질보증-15100-016)

두산중공업(주)

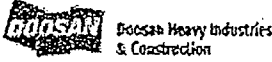
(A4/복사용지)

 Doosan Heavy Industries & Construction		NONCONFORMANCE REPORT(NCR) 부 적 합 보 고 서		NCR No. : NCR_070643 Rev No. : 0 Date Found : 2007-12-14 발견 일자	
Project : Sequoyah #2 RSG 사업명		DWG. No. : D-SB-21141-M02(1/2) 도면번호		Rev. : 2 개정	
PJT No : N06010 공사번호		TRV. No. : 100422715 트래블러번호		Rev. : 개정	
Item No./Name : N060101-SB21141M02-0201A / LOWER 품목번호/품목명 SHELL ASSY		Oper. No. : 470 / WELDING (SAW) 공정번호			
Customer/Vendor : Westinghouse Electric Company, LLC. / 고객 / 업체 N/A		RICR. NO. : N/A 수검번호			
Nonconforming Condition(부적합내용) : Attach(유첨) <input type="checkbox"/> Yes(유) <input checked="" type="checkbox"/> No(무) 2A Tubesheet와 Lower shell의 girth seam 내면 용접중 용접작업 중단되었으나 작업 중단 후 후열이 WPS 요건에 따라 유지되지 않았으며, 용접부에 크랙이 육안으로 관찰됨. (During 2A set Tubesheet to Lower shell inside welding, welding was stopped without performing extend preheat per WPS requirement and crack is observed on weld bead.) WPS(A-MA-0303-216 Rev.0) : 용접작업 도중 작업 중단시 210 ~ 300 ℃에서 최소 4시간 후열 실시(extend preheat should be performed for minimum 4 hours at 210 ~ 300 ℃ when interrupting the welding operation)					
Prepared by : 이원만.LEE WON-MAN		07-12-18		재 질	SA508 CL.3
작 성 자 원자력)원자력품질관리부		Date		수 량	1
				불량유형	Crack_CR
				불량원인	작업환경
Recommended Disposition : <input type="checkbox"/> Use-as-is <input type="checkbox"/> Repair <input checked="" type="checkbox"/> Rework <input type="checkbox"/> Reject <input type="checkbox"/> Others <input type="checkbox"/> Depreciation 1. 용접부를 가우징 및 사상으로 완전 제거하고, 재작업 착수 전 모재 건전성 확인을 위하여 MT 수행할 것. Remove the welded area with gouging or grinding and then verify the soundness of base metal by MT exam before rework. 2. 재작업은 트래블러 NCR-070643N에 따라서 수행할 것. Rework shall be performed in accordance with NCR-070643N.					
Report to 10 CFR 21 : () Yes, () No S. N. G. 7/16/08					
Recommended by : 고경백.KO GYOUNG-BACK		07-12-18		Reviewed & Approved by : 김승원.KIM SUNG-WON	
재 안 자 원자력)원자력생산기술팀		Date		검 토 및 승 인 자 원자력)원자력생산기술팀	
				Date	
Corrective Action Required : <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 시 정 조 치 필 요 CAR No. :					
Reviewed by : 이원만.LEE WON-MAN		07-12-20		Approved by : 박세완.PARK SE-WAN	
검 토 자 원자력)원자력품질관리부		Date		승 인 자 원자력)원자력품질관리부	
				Date	
Accepted by : 수 락 자 _____ Date _____ Customer ANI/AI 12.2007 Date					
Verification of Final Disposition(최종확인) <input checked="" type="checkbox"/> ACCEPTABLE 합 격 <input type="checkbox"/> NOT ACCEPTABLE 불 합 격			Verified by : 최종 확인자 _____ Date 12/2/08 원자력)원자력품질관리부 Customer _____ Date 12/3/08 ANI/AI		

(품질보증-15100-016)

두산중공업(주)


(A4/복사용지)

		NONCONFORMANCE REPORT(NCR) 부 적 합 보 고 서		NCR No. : NCR_070482 Rev No. : 0 Date Found : 2007-09-11 발견일자	
Project : Entergy RRVH Project 사업명		DWG. No. : D-WC-11101-M09 도면번호		Rev. : 0 개정	
PJT No : N05004 공사번호		TRV. No. : 100400890 트래블러번호		Rev. : 0 개정	
Item No./Name : N050042-11101M03-0301C / CLS HEAD AND 품목번호/품목명 NOZ ASSY-CEDM NOZ INSTALLATION		Oper. No. : 110 / WELDING 공정번호			
Customer/Vendor : WESTINGHOUSE / N/A 고객/업체		RICR. NO. : N/A 수검번호			
Nonconforming Condition(부적합내용) : Attach(유청) <input checked="" type="checkbox"/> Yes(유) <input type="checkbox"/> No(무) Welding operator qualification test for ANO2 and Waterford 3 RRVH Project closure head nozzle welding is incomplete. Welding operator qualification test has been performed in 1G position. Actual production welding position is 0 degree to 57 degree. Therefore, the current welding operator qualification does not cover all production welding. In accordance with ASME Section IX QW-303.3, special positions test are required to cover the ranges of vertical orientation 15 degrees above horizontal. - Welding Operator Identification : AMJ, AOB, BES, BGN, BOL, ERA ※ ANO 2 TRV. & Oper. : 100394275 Rev.0 & 110. DWG No. : D-AB-11101-M09 Rev.0					
Prepared by : 이원만.LEE WON-MAN 작성 자 원자력)원자력품질관리부		07-09-12 Date		제 결 S8166 UNSN06690 수량 1 불량유형 자격 관리	
Recommended Disposition : <input checked="" type="checkbox"/> Use-as-is <input type="checkbox"/> Repair <input type="checkbox"/> Rework <input type="checkbox"/> Reject <input type="checkbox"/> Others <input type="checkbox"/> Depreciation Use-as-is with additional acceptable test. 1. Welder performance qualification will be performed newly with 30 degree and 45 degree. (Reference TRV No. ERST05 Rev.0) - Welding operator will perform welding every 3 passes on each test plates. - After welding, RT examination shall be performed. <div style="text-align:right; border: 1px solid black; padding: 5px;"> Report to 10 CFR 21 : () Yes, () No 07-09-12 </div>					
Recommended by : 고경백.KO GYOUNG-BACK 제 안 자 원자력)원자력생산기술팀		07-09-12 Date		Reviewed & Approved by : 김승원.KIM SUNG-WON 검 토 및 승 인 자 원자력)원자력생산기술팀	
Corrective Action Required : <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 시 정 조 치 필 요 CAR No.:					
Reviewed by : 이원만.LEE WON-MAN 검 토 자 원자력)원자력품질관리부		07-09-13 Date		Approved by : 박세원.PARK SE-WAN 승 인 자 원자력)원자력품질관리부	
Accepted by : 수 락 자 Bob Tupper Customer		07-10-23 Date		Steven N. Rathburn ANI/AI 07-09-13 Date	
Verification of Final Disposition(최종확인) <input checked="" type="checkbox"/> ACCEPTABLE 합 격 <input type="checkbox"/> NOT ACCEPTABLE 불 합 격		Verified by : 최종 확인자 이원만.LEE WON-MAN 원자력)원자력품질관리부 07-10-24 Date Customer ANI/AI Date 10-24-07			

(품질보증-15100-016)

두산중공업(주)

(A4/복사용지)

 Doosan Heavy Industries & Construction		CORRECTIVE ACTION REPORT(CAR) 시 정 조 치 보 고 서		CAR NO. : CAR_080053 보고서번호 Req Reply Date : 2008-05-31 회신요구일자
To : 원자력)원자력품질관리부 수신처				
PJT No : N06010 사업번호		Custome : Westinghouse Electric Company, LLC. 고객		
Project : Sequoyah #2 RSG 사업명		NCR/ADR/CAR No : CAR_080033 불일치/감사/시정번호		
Conditions(상태) : For Corrective Action Report, determination of 10 CFR 21 applicability was not described on Corrective Action Report in accordance with PQAP-1602. Report to 10 CFR 21 () Yes. (V) No				
Recommended Corrective Action(시정조치방안) : - Perform the root cause analysis and preventive action of recurrence.				
Prepared by : 임경선.LIM KYEONG-SEON 08-05-28 작 성 자 원자력)원자력품질관리부 Date				
Cause and Corrective Action Response(원인 분석 및 시정 조치 계획) : Refer to the attached RCA-CAR_080053				
Responded by : 이원만.LEE WON-MAN 08-05-29 Approved by : 박세완.PARK SE-WAN 08-05-29 회 신 자 원자력)원자력품질관리부 Date 승 인 자 원자력)원자력품질관리부 Date <input checked="" type="checkbox"/> Approved 승인 <input type="checkbox"/> Disapproved 승인불가 <input type="checkbox"/> Approved with Comments 조건부 승인 Comments(주 석) :				
Reviewed by : 공정식.GONG JUNG-SIK 08-05-29 Approved by : 박세완.PARK SE-WAN 08-05-29 검 토 자 원자력)원자력품질관리부 Date 승 인 자 원자력)원자력품질관리부 Date				
Verification of Corrective Action 시 정 조 치 의 확 인 <input checked="" type="checkbox"/> Satisfactory 만 족 <input type="checkbox"/> Required Re-Corrective Action(New CAR No. :) Verified by : 임경선.LIM KYEONG-SEON 08-05-29 승 인 자 원자력)원자력품질관리부 Date Approved by : 박세완.PARK SE-WAN 08-05-29 승 인 자 원자력)원자력품질관리부 Date				

(품질보증-15200-012)

두산중공업(주)

(A4/복사용지)

Record No. RCA_CAR_080053

DOOSAN

Root Cause Analysis & Corrective Action

Subject: Missing determination of 10CFR21 applicability on CAR

Date : 2008. 05. 29

**(NQC) Dept
Nuclear Business Group**

Approved by : 김민준 5/29/08
Reviewed by : 김민준 5/29/08
Prepared by : 김민준 5/29/08

DOOSAN**1. Summary Description of the Problem(Including Sketch, Photo, When necessary)**

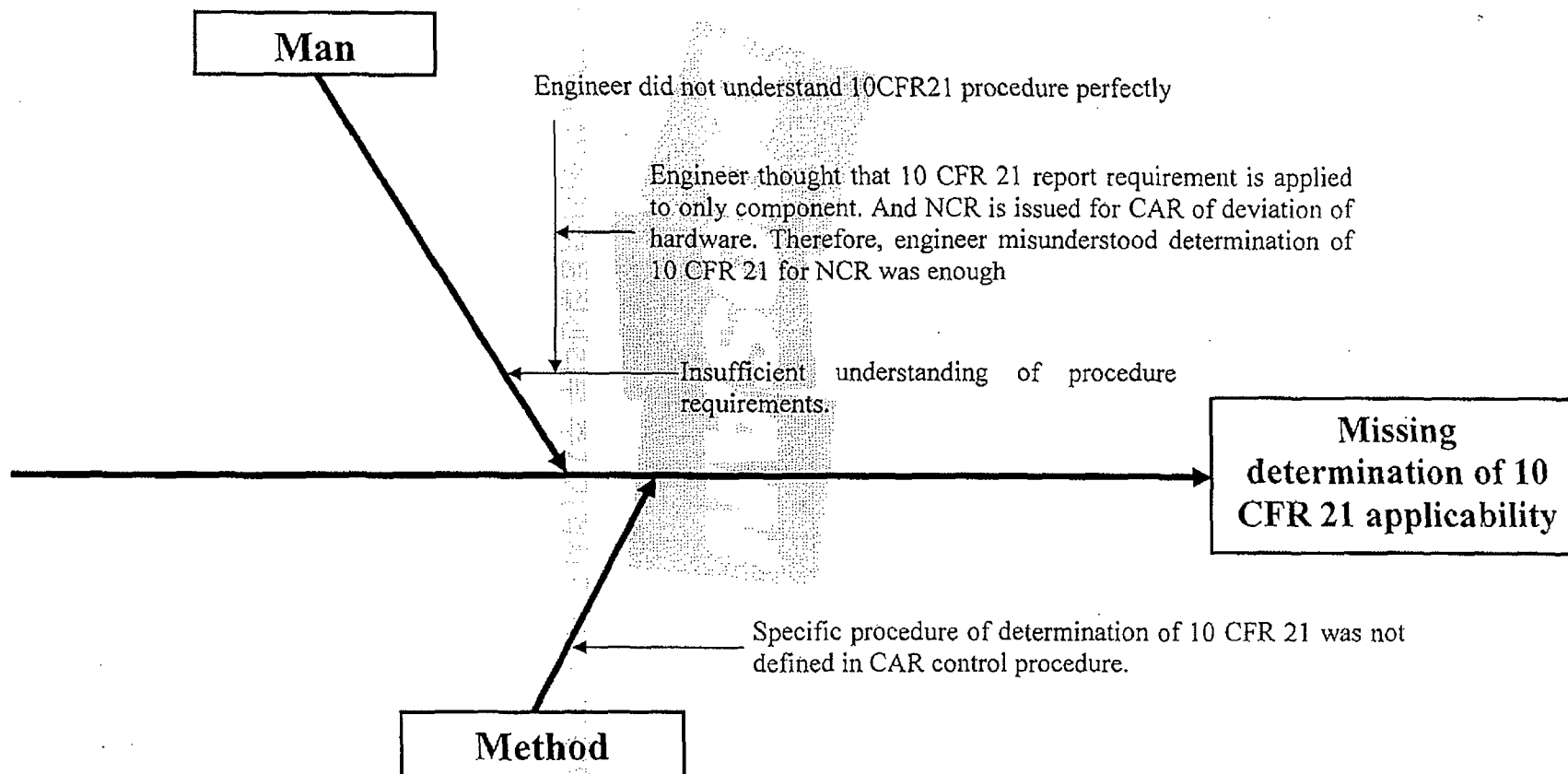
During US NRC inspection in DOOSAN, the following condition was pointed out by US NRC.
For Corrective Action Report, determination of 10 CFR 21 applicability was not described on
Corrective Action Report in accordance with PQAP-1602.

Example)

DOOSAN DOOSAN Heavy Industries & Construction		CORRECTIVE ACTION REPORT(CAR) 시정 조치 보고서		CAR NO. 보고서 번호 CAR-080053	Not Ready Date 작성요구일자 2008-03-31
To 수신처	발전팀(보급팀)				
PJT No 사업번호	NO6019	Disclose 고시	Westinghouse Electric Company, LLC.		
Project 사업명	Sequoyah #2 RS2	NOT/ARC/CAR No 불합치/관사/시정번호	NOI_080139		
<p>Conditions(현황):</p> <p>After machining of lower level tee nozzle hole of lower vessel assembly of Sequoyah 2D set RS2, it was found that the inside diameter of lower level tee nozzle hole is out of tolerance locally. The same nonconformance was required after Sequoyah 2A set RS2.</p> <p>서크라이 RS2 Lower Vessel의 Lower Level Tee Nozzle Hole 가공 후 내면에 Usage에 의한 치수불량(발생형)이 발견되어 RS2 RS2에 발생한 불량과 동일한 불량이 반복되어 발생함.</p> <p>Recommended Corrective Action(시정조치요청):</p> <p>- Perform the root cause analysis and take corrective action to prevent recurrence.</p> <p>- 조차 발생의 대한 근본적인 원인 분석 및 예방조치 취치 수임</p>					
<p>Report to 10CFR21: () Yes, () No</p>					
<p>Prepared by: 이원만 LEE WON-MAN 08-03-21</p> <p>의 사 장 관리자(관리팀) Date</p>					
<p>Cause and Corrective Action Response(원인 분석 및 시정 조치 계획):</p> <p>1. Cause</p> <p>2. Effect</p> <p>3. Action</p> <p>4. Response</p> <p>5. Verification</p> <p>6. Approval</p> <p>7. Comments</p>					
<p>Responded by: 주현도 08-03-24 Approved by: 윤영철 08-03-24</p> <p>의 사 장 발신(관리팀) Date 승인 자 발신(관리팀) Date</p>					
<p>Not Approved 승인 [] Disapproved 승인불가 [] Approved with Comments 조건부 승인</p> <p>Comments(주석):</p>					
<p>Reviewed by: 이원만 LEE WON-MAN 08-03-26 Approved by: 박성환 PARK SE-HWAN 08-03-27</p> <p>의 사 장 관리자(관리팀) Date 승인 자 관리자(관리팀) Date</p>					
<p>Verification of Corrective Action</p>					

DOOSAN

2. Root Cause Analysis



DOOSAN**3. Corrective Action to prevent recurrence**

Root cause	Corrective action	Who When	Status after corrective action
Insufficient understanding of NQCP-1501 requirements	Re-train the related personnel for PQAP-1602 requirements.	NQC (2008.05.29)	Satisfactory
Specific procedure of determination of 10 CFR 21 was not defined in CAR control procedure	Establish Nuclear BG CAR control procedure(NQCP-1602) and add the specific procedure of determination of 10 CFR 21	NQC (2008.05.29)	Satisfactory

DOOSAN**4. Generic impact relative to other products, services, procedures, process or systems****None****(10 CFR 21 applicability was determined for all CARs. And any CAR do not need to report to US NRC. See the applicable CAR list.)**

NO.	CAR NO.	PJT	OPEN DATE	CLOSE DATE	NCR NO.	NO.	CAR NO.	PJT	OPEN DATE	CLOSE DATE	NCR NO.
1	CAR_050051	Entergy RRVCH	2005.10.06	2006.03.20	N/A	8	CAR_070066	Palo Verde RRVCH & CEDM	2007.06.24	2007.07.05	N/A
2	CAR_060048	Entergy RRVCH	2006.04.07	2006.05.02	N/A	9	CAR_080035	Palo Verde RRVCH & CEDM	2008.03.26	2008.04.21	NCR_080157
3	CAR_070050	Entergy RRVCH	2007.05.18	2007.06.27	N/A	10	CAR_070108	Sequoyah 2 RSG	2007.10.05	2007.10.15	N/A
4	CAR_070055	Entergy RRVCH	2007.05.25	2007.06.01	NCR_070309	11	CAR_080003	Sequoyah 2 RSG	2008.01.15	2008.01.18	N/A
5	CAR_070062	Entergy RRVCH	2007.06.05	2007.06.27	NCR_070329	12	CAR_080016	Sequoyah 2 RSG	2008.01.28	2008.02.15	N/A
6	CAR_070076	Entergy RRVCH	2007.07.13	2007.09.12	N/A	13	CAR_080033	Sequoyah 2 RSG	2008.03.21	2008.04.02	NCR_080139
7	CAR_080045	Entergy RRVCH	2008.05.20	2008.05.29	N/A	14	CAR_080040	Sequoyah 2 RSG	2008.04.15	2008.04.28	N/A

교육 훈련 계획

Training & Indoctrination Schedule

Schedule No: NQCD-CAR-080528

작성 일자 : 2008.05.28

1. 교육 교과목 : PQAP-1602 REV.5 DRAFT(10CFR 21 절차서),
NQCP-1602 REV.0 DRAFT(CAR 절차서),
PQAP-0701 REV.3 (CGI 절차서)

2. 교육 대상자 : NQC Engineer

3. 교육 일시 : 2008.05.28

4. 교육 강사 : 박세원 부장


5. 교육 장소 : 회의실

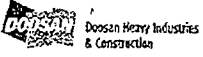
6. 교육 방법 : 강의식

승인자 :

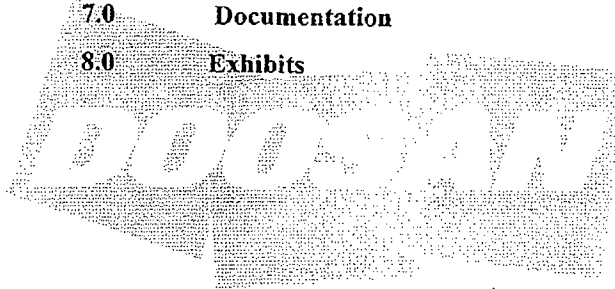
원자력품질관리부장

날 짜


 TRAINING SESSION COMPLETION RECORD			
COURSE TITLE : 과 정 명 PQAP-1602 REV.5 DRAFT(10CFR 21. 절차서), NQCP-1602 REV.0 DRAFT(CAR 절차서) PQAP-0701 REV.3 (CGI 절차서)		COURSE NO : 과 정 번 호 N/A	
INSTRUCTOR : 박세원		TRAINING SCHEDULE NO: NQCD-CAR-080528	
TRAINING DATE : 교 육 일 자 2008-5-29		DURATION : 교육 시간 40 minutes	
PAGE : 1 OF 1			
ATTENDEES			
NAME 성 명	ORGANIZAITON 소 속	POSITION 직 위	SIGNATURE 서 명
신경선	NQC	과장	[Signature]
김유해	"	"	[Signature]
권병수	"	"	[Signature]
정광성	"	주무	[Signature]
김종호	"	"	[Signature]
박성웅	"	과장	[Signature]
백현진	"	과장	[Signature]
최병진	"	차장	[Signature]
기원만	"	과장	[Signature]
백현진	"	과장	[Signature]
김용철	"	"	[Signature]
이종호	"	"	[Signature]

	NUCLEAR BG QUALITY CONTROL PROCEDURE NQCP-300		QCP NO : NQCP-1602 REV NO : 0 DATE : 05/28/2008 PAGE : 1 OF 10
	Control of Corrective Actions		
ASME III/KEPIC MN	ISO 9001	ASME VIII/KEPIC MG	

- 1.0 Preface
- 2.0 Scope
- 3.0 Application
- 4.0 References
- 5.0 General
- 6.0 Procedure
- 7.0 Documentation
- 8.0 Exhibits



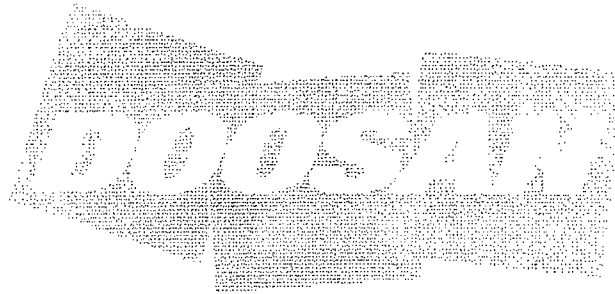
W. M. Lee	S. W. PMS	G. K. Kim
5.28.08	5.28.08	May. 28. 2008
NAME	NAME	NAME
DATE	DATE	DATE
Prepared by Nuclear Quality Control Dept..	Reviewed/Approved by Nuclear Quality Control Dept. Gen. Mgr	Reviewed/Approved by QA Team Gen. Mgr.


 Doosan Heavy Industries & Construction	NUCLEAR BG QUALITY CONTROL PROCEDURE NQCP-300	QCPNO: NQCP-1602 REVNO: 0 DATE : 05/28/2008 PAGE : 2 OF 10
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Control of Corrective Actions

Revision History(개정이력)

No.	Date	Revision	Prepared by	Reviewed/Approved by	
0	05/28/2008	<input type="radio"/> First Issue	W.M.Lee	S.W.Park	S.K.Kim



 Doosan Heavy Industries & Construction	NUCLEAR BG QUALITY CONTROL PROCEDURE NQCP-300	QCPNO:NQCP-1602 REVNO:0 DATE :05/28/2008 PAGE :3 OF 10
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Control of Corrective Actions

1.0 PREFACE

- 1.1 This Nuclear BG Quality Control Procedure (NQCP) is established by the NQC Department under the direction and authority of the Head of Nuclear BG.

2.0 SCOPE

- 2.1 This Procedure provides the details describing the authority, responsibilities and prescribes the methods to be implemented by Doosan Heavy Industries & Construction Co., Ltd. to identify quality related problems, develop and implement appropriate corrective actions and actions to prevent recurrence, follow-up actions, reporting to management and documenting the corrective action activities.

3.0 APPLICATION


- 3.1 This Procedure shall be applied to all quality related activities covered by the Quality Program Manuals identified in QCP-0102 Appendix A.

4.0 REFERENCES

- 4.1 This Procedure shall be maintained in accordance with the requirements of the documents referenced in QCP-0104 Appendix and Table 1.

TABLE 1 : REFERENCES

- 1) ASME Boiler and Pressure Vessel Code, Section III, NCA- 3800
- 2) ASME Boiler and Pressure Vessel Code, Section III, NCA- 4000
- 3) ASME Boiler and Pressure Vessel Code, Section VIII-1, Appendix 10
- 4) ASME Nuclear Components, NQA-1, Basic and Supplementary Req'ts..
- 5) International Standard ISO 9001:2000

 Doosan Heavy Industries & Construction	NUCLEAR BG QUALITY CONTROL PROCEDURE NQCP-300	QCP NO : NQCP-1602 REV NO : 0 DATE : 05/28/2008 PAGE : 4 OF 10
Control of Corrective Actions		

6) KEPIC QA, MN, EN, SN & MG


5.0 GENERAL

5.1 The identification of quality *and product safety* related problems which may require corrective action or eliminate causes of nonconformances is included to the following, but not limited

- a) Inspection and Test Reports
- b) Process monitoring
- c) Field complaints
- d) Audit findings
- e) Nonconformance Reports
- f) Customer observations
- g) Vendor Surveillance/Inspection
- h) Report by Doosan Heavy Industries & Construction Co., Ltd. staff personnel.
- i) Weld Repairs
- j) Incomplete Condition Sheets
- k) Trend Analysis

5.2 The quality related problems to be considered may include, but shall not be limited to:

- a) Quality system deficiencies
- b) Failures, deficiencies or deviations in the production process
- c) Inadequate procedures and documentation
- d) Noncompliance with procedures
- e) Ineffective work control
- f) Excessive Cost

 Doosan Heavy Industries & Construction	NUCLEAR BG QUALITY CONTROL PROCEDURE NQCP-300	QCPNO : NQCP-1602 REVNO : 0 DATE : 05/28/2008 PAGE : 5 OF 10
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Control of Corrective Actions

- 5.3 Nonconformances or ineffective control identified by the Customer shall be investigated and corrective action implemented in a prompt and expeditious manner. If necessary, The NQC Dept. or QA Team shall document the Customer request on the Doosan Heavy Industries & Construction Co., Ltd. Corrective Action Report (CAR) and forward it to the responsible organization for processing in accordance with this procedure. If requested, a copy of the CAR shall be submitted to the Customer for review and approval.

6.0 PROCEDURE

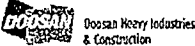
6.1 Corrective action - Doosan Heavy Industries & Construction Co., Ltd.

- 6.1.1 When quality related problems or potential causes of nonconformances are identified, the applicable Quality Engineer shall prepare the CAR (Exhibit 1) as follows:

- a) Assign CAR No.
- b) Identify recipient of CAR
- c) Reference Subproject number, Project and Customer, if necessary
- d) Reference NCR/ADR/CAR No. (If applicable)
- e) Document significant conditions
- f) Determination of 10 CFR 21 Applicability (If applicable)
- g) Provide recommended corrective action (If applicable)
- h) Provide required reply due date
- i) Sign and date CAR

- 6.1.2 The Quality Engineer shall enter the following CAR information on the CAR Log (Exhibit 2).

- a) Identity of Dept maintaining the log
- b) Subproject Number

	NUCLEAR BG QUALITY CONTROL PROCEDURE NQCP-300	QCP NO : NQCP-1602 REV NO : 0 DATE : 05/28/2008 PAGE : 6 OF 10
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Control of Corrective Actions

- c) Project name
- d) Sequence number
- e) CAR Number
- f) Date CAR is opened
- g) Date CAR is closed (to be entered later)
- h) Description of Condition reported on CAR
- i) Identity of Dept required to take action
- j) A R(Audit Report) Number., etc.
- k) NCR Number
- l) Initials of person and Dept accepting the action taken. (to be entered later)
- m) Any noteworthy remarks

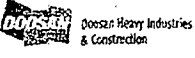
6.1.3 The Quality Engineer shall then issue the CAR to the organization responsible for providing corrective action.

6.1.4 Determination of 10 CFR 21 Applicability


For the CAR related to the nuclear items which are supplied to U.S.A the following requirements shall be applied.

- 1) When CAR is issued, NQC Dept. or QA Team shall determine whether the identified condition represents a 'substantial safety hazard' and describe the results on the CAR like "Report to 10CFR21 () Yes, () No"
- 2) If "Report to 10CFR21" is required, it shall be processed in accordance with PQAP-1602.

6.1.5 Management of the responsible organization shall take the appropriate measures to verify that the deficiency is valid, perform analysis to determine the cause, and respond by the required reply date, documenting the cause and action to be taken to prevent recurrence and the date the action will be completed on the CAR. The action to be taken shall include training of the individuals involved in the cause of the nonconformance requiring corrective action and, if required, procedure and other document revisions.

	<p align="center">NUCLEAR BG QUALITY CONTROL PROCEDURE NQCP-300</p>	<p>QCPNO : NQCP-1602 REVNO : 0 DATE : 05/28/2008 PAGE : 7 OF 10</p>
Control of Corrective Actions		

- 6.1.6 The person or organization responsible for correction of the condition shall prepare a corrective action response to the CAR. Management of the organization responsible for implementing corrective action shall approve the response and return the CAR to the issuing NQC Dept. or QA Team by the response due date.
- 6.1.7 Upon receipt of the response to the CAR the responsible NQC Dept. or QA Team shall review the response and evaluate the proposed corrective action to be taken and the timeliness of its proposed implementation. If acceptable, the NQC Dept. General Manager or QA Team General Manager shall sign and date the approval of the CAR. If the response is unacceptable he shall return the CAR to the responsible organization and request that more appropriate corrective action measures be taken.
- 6.1.8 If implementation date is delayed, the person or organization responsible for correction of the condition shall submit the implementation date to NQC Dept. or QA team.
- 6.1.9 Follow-up shall be performed by the assigned Quality Engineer within two weeks after the implementation date of the corrective action to ensure that approved actions have been effectively implemented and required results have been attained.
- 6.1.10 If the corrective action implemented is unsatisfactory a new CAR may issued by the assigned Quality Engineer and processed.
- 6.1.11 When effective corrective action has been verified the Quality Engineer shall sign and date the CAR and forward the CAR to the responsible NQC Dept. General Manager or QA Team General Manager for approval.
- 6.1.12 A copy of the completed CAR shall be distributed by the responsible NQC Dept. or QA Team to appropriate levels of management having responsibility for the corrective action

 Doosan Heavy Industries & Construction	NUCLEAR BG QUALITY CONTROL PROCEDURE NQCP-300	QCP NO : NQCP-1602 REV NO : 0 DATE : 05/28/2008 PAGE : 8 OF 10
Control of Corrective Actions		

6.1.13 The Quality Engineer shall then close out the entry in the CAR Log.

7.0 DOCUMENTATION

7.1 Corrective Action Reports and related documentation shall be maintained in accordance with the approved QA Record Control Procedure.


8.0 EXHIBITS

Exhibit 1 : Corrective Action Report (CAR)

Exhibit 2 : CAR Log

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Exhibit 1 : Corrective Action Report (CAR)

 CORRECTIVE ACTION REPORT (CAR) 시 정 조 치 보 고 서		CAR No. : _____ Req. Reply Date : _____ 회신 요구 일자	
To : _____ 수신처			
PJT No. : _____ 사업번호		Customer : _____ 고객	
Project : _____ 사업명		NCR/ADR/CAR No. : _____ 분일치/감사/시정번호	
Conditions (상태) : _____ Recommended Corrective Action (시정조치방안) : _____ Prepared by : _____ Date _____ 작성자			
Cause and Corrective Action Response (원인 분석 및 시정 조치 계획) : _____ Responded by : _____ Date _____ 회신자			
Approved by : _____ Date _____ 승인자			
<input type="checkbox"/> Approved 승인 <input type="checkbox"/> Disapproved 승인불가 <input type="checkbox"/> Approved with comments 조건부 승인 Comments(주석) : _____ Reviewed by : _____ Date _____ 검토자			
Approved by : _____ Date _____ 승인자 () Gen.Mgr			
Verification of Corrective Action : _____ 시 정 조 치 의 확 인 <input type="checkbox"/> Satisfactory 만 족 <input type="checkbox"/> Required Re-Corrective Action(New CAR No. : _____) 재시정조치요 신규시정번호			
Verified by : _____ Date _____ 확인자			
Approved by : _____ Date _____ 승인자 () Gen.Mgr			

(품질-B-033)


두산중공업㈜

(A4/복사용지)

NQCP-1602, REV NO : 0, 05/28/2008, PAGE : 10 OF 10

Exhibit 2 : CAR Log


Pjt. NO. :		CORRECTIVE ACTION REPORT(CAR) LOG						Maintained by () Dept	
Project :									
NO	CAR NO.	Open Date	Conditions Adverse to Quality	Required Dept	A R No.(ETC)	NCR No.	Accepted by	Remark	
		Close Date					Dept		

	CORRECTIVE ACTION REPORT(CAR) 시정 조치 보고서		CAR NO. : CAR_050051 보고서번호 Rec Reply Date : 2005-10-26 회신요구일자
	To : 원자력)원자력구매팀 수신처		
PJT No : N05004 사업번호	Custome : WESTINGHOUSE 고객		
Project : Entergy RRVH Project 사업명	NCR/AOR/CAR No : 불일치/감시/시정번호		
Conditions(상태) : For AND #2 RRVCH Head Forging, Crusot Forge does not notified witness point prior to start of Preliminary Heat Treatment at Quality Plan(No. : 854) operation No. 04. <p style="text-align: right;">"Report to 10CFR 21 : () Yes, () No" 원자력)원자력구매팀</p>			
Recommended Corrective Action(시정조치방안) : : Perform Root Cause Analysis and Corrective Action.			
Prepared by : 손진만. 05-10-06 작성자 원자력)원자력품질관리부 Date			
Cause and Corrective Action Response(원인 분석 및 시정 조치 계획) : See attached RCA(attachment 1) and CF Response(attachment 2).			
Responded by : 권기혁.KWEON KI-HYUG 05-10-26 Approved by : 김옥규.KIM OK-KYU 05-10-26 회신자 원자력)원자력구매팀 Date 승인자 원자력)원자력구매팀 Date <input checked="" type="checkbox"/> Approved 승인 <input type="checkbox"/> Disapproved 승인불가 <input type="checkbox"/> Approved with Comments 조건부 승인 Comments(주석) :			
Reviewed by : 손진만. 05-10-26 Approved by : 허남열. 05-10-26 검토자 원자력)원자력품질관리부 Date 승인자 원자력)원자력품질관리부 Date			
Verification of Corrective Action 시정 조치 의 확인 <input checked="" type="checkbox"/> Satisfactory 만족 Verified by : 손진만. 06-02-20 승인자 원자력)원자력품질관리부 Date <input type="checkbox"/> Required Re-Corrective Action(New CAR No. :) Approved by : 서정국. 06-03-20 승인자 원자력)원자력품질관리부 Date			

(품질보증-15200-012)

두산중공업(주)


(A4/복사용지)

	CORRECTIVE ACTION REPORT(CAR) 시정 조치 보고서		CAR NO. : CAR_060048 보고서번호 Req Reply Date : 2006-04-21 회신요구일자
	To : 원자력)원자로설계팀 수신처		
PJT No : N05004 사업번호	Custome : WESTINGHOUSE 고객		
Project : Entergy RRVH Project 사업명	NCR/AOR/CAR No : 불일치/감사/시정번호		
Conditions(상태) : <p>The inside diameter shown on CEDM Nozzle Calibration Block drawing D-WC-11102-010, Rev.0 was incorrectly transferred from closure head drawing D-WC-11101-030, Rev.1.</p> <p>- D-WC-11101-030 and its corresponding original GE drawing show inside diameter as 2.728 inches.</p> <p>- The Calibration block drawing D-WC-11102-010 shows a value of 2.782 inches.</p> <p style="text-align: right;">" Report to 10CR21 : C) Yes, LV) NO "</p>			
Recommended Corrective Action(시정조치방안) : <p>Perform the Root Cause Analysis and Corrective Action as per PQAP-1603.</p>			
Prepared by : 손진만.SON JIN-MAN 06-04-07 작성자 원자력)원자력품질관리부 Date			
Cause and Corrective Action Response(원인 분석 및 시정 조치 계획) : <p>See attached "RCA_060050".</p>			
Responded by : 정인수.JEONG MIN-SU 06-04-10 Approved by : 박화규.PARK HWA-GYU 06-04-10 회신자 원자력)원자로설계팀 Date 승인자 원자력)원자로설계팀 Date			
<input checked="" type="checkbox"/> Approved 승인 <input type="checkbox"/> Disapproved 승인불가 <input type="checkbox"/> Approved with Comments 조건부 승인 Comments(주석) :			
Reviewed by : 손진만.SON JIN-MAN 06-04-10 Approved by : 서정국.SEO JUNG-KOOK 06-04-10 검토자 원자력)원자력품질관리부 Date 승인자 원자력)원자력품질관리부 Date			
Verification of Corrective Action 시정 조치 의 함 인 <input checked="" type="checkbox"/> Satisfactory 만족			
<input type="checkbox"/> Required Re-Corrective Action(New CAR No. :) 승인자 원자력)원자력품질관리부 Date			
Approved by : 손진만.SON JIN-MAN 06-04-21 승인자 원자력)원자력품질관리부 Date			
Approved by : 김진규.KIM JIN-GYOO 06-05-02 승인자 원자력)원자력품질관리부 Date			

(품질보증-15200-012)

두산중공업(주)


(A4/복사용지)

 Doosan Heavy Industries & Construction		CORRECTIVE ACTION REPORT(CAR) 시정 조치 보고서		CAR NO. : CAR_070050 보고서번호 Req Reply Date : 2007-06-01 회신요구일자
To : 원자력)원자력공장 수신처				
PJT No : N05004 사업번호		Custome : WESTINGHOUSE 고객		
Project : Entergy RRVH Project 사업명		NCR/ADR/CAR No : 불일치/감사/시정번호		
Conditions(상태) : <p>The preliminary notification shall be provided to Westinghouse on or before the 20th day of the preceding month. And for W/H points in the preliminary notification that Entergy has selected to execute, Doosan shall provide final notification to Westinghouse five (5) days prior to the scheduled date indicated in the preliminary notification per PROJECT QUALITY PLAN(AN02MF3-PRVCH-OP-01. Rev. 1)</p> <p>For AN02 RV Closure Head Nozzle hole J-groove buttering PT, the preliminary notification date was May 23, 2007 and final notification date was May 20, 2007. And the actual inspection is performed on May 18, 2007 which is earlier than the notified date. Therefore, the Entergy representative will miss this PT.</p> <p style="text-align: right;">" Report to 10 CFR 21 = () Yes, (X) No "</p>				
Recommended Corrective Action(시정조치방안) : Perform the root cause analysis and corrective action per NQCP-1603.				
Prepared by : 이원만.LEE WON-MAN 07-05-18 작 성 자 원자력)원자력품질관리부 Date				
Cause and Corrective Action Response(원인 분석 및 시정 조치 계획) :				
1. ROOT CAUSE - Shop manager didn't have reference traveler to check the customer's witness point - The shop manager didn't check the customer's inspection date after catching up the schedule				
2. Corrective action response - To notify exact inspection date, SHOP Manager prepared QP point list and reference traveler together - SHOP Manager will check the inspection date at 5:30 every during TFT meeting with project related people				
Responded by : 이동현. 07-06-15 Approved by : 손병일. 07-06-15 회 신 자 원자력)원자력공장 Date 승 인 자 원자력)원자력공장 Date				
<input checked="" type="checkbox"/> Approved 승인 <input type="checkbox"/> Disapproved 승인불가 <input type="checkbox"/> Approved with Comments 조건부 승인 Comments(주 석) :				
Reviewed by : 이원만.LEE WON-MAN 07-06-15 Approved by : 박세완.PARK SE-WAN 07-06-18 검 토 자 원자력)원자력품질관리부 Date 승 인 자 원자력)원자력품질관리부 Date				
Verification of Corrective Action 시 정 조 치 의 확 인 <input checked="" type="checkbox"/> Satisfactory 만 족 <input type="checkbox"/> Required Re-Corrective Action(New CAR No. :)				
Verified by : 이원만.LEE WON-MAN 07-06-27 승 인 자 원자력)원자력품질관리부 Date Approved by : 허남열.HUR NAM-YEOL 07-06-27 승 인 자 원자력)원자력품질관리부 Date				

(품질보증-15200-012)

두산중공업(주)


(A4/복사용지)

 Doosan Heavy Industries & Construction		CORRECTIVE ACTION REPORT(CAR) 시정 조치 보고서		CAR NO. : CAR_070076 보고서번호 Req Reply Date : 2007-09-07 회신요구일자
To : 원자력)원자력생산관리팀(주)영진테크 수신처				
PJT No : N05004 사업번호		Custome : WESTINGHOUSE 고객		
Project : Entergy RRWH Project 사업명		NCR/ADR/CAR No : 불일치/감사/시정번호		
Conditions(상태) : AN02 RRWH ICI Nozzle 최종 가공결과 2 pcs의 길이가 도면 요건을 벗어남. - 도면 요구 : 1076.5 ± 0.4 mm - 실제 길이 : 1075.80, 1075.75 mm (Part ID No. 01-401-01 & 01-401-02) After final machining of AN02 RRWH ICI Nozzle, length of two nozzle is shorter than drawing requirement. (Part ID No. 01-401-01 & 01-401-02) "Report to IOCR21 : C > Yes, NOCV)" Recommended Corrective Action(시정 조치방안) : 원인분석 및 재발방지 대책 수립하여 제출요망. Perform the root cause analysis and corrective action.				
Prepared by : 이원만.LEE WON-MAN 07-07-13 작성자 원자력)원자력품질관리부 Date				
Cause and Corrective Action Response(원인 분석 및 시정 조치 계획) : 1. 원인분석 . 작업자의 부주의로 인하여 장비의 Chuck 에서 제품이 빠져나온 상태에서 단면 가공 작업을 하였음. . 내경 가공 중 Chip 배출을 고려하여 Chuck Jaw의 가공을 최소화함으로 인하여 윤곽부가 불충분하여 가공 중 제품이 Chuck으로부터 빠져 나옴. 2. 재발방지 대책 . 작업자에 대한 충분한 사전 교육 실시 . 가공 작업시 제품 상태를 수시로 확인 하면서 작업할 것 . 장비 Chuck Jaw를 충분한 길이로 가공하여, 가공 중 제품의 이탈을 방지 할 것 첨부 : 개선 사진 1매				
Responded by : 김옥규.KIM OK-KYU 07-09-05 회신자 원자력)원자력생산관리팀 Date		Approved by : 이윤근. 07-09-05 승인자 원자력)원자력생산관리팀 Date		
<input checked="" type="checkbox"/> Approved 승인 <input type="checkbox"/> Disapproved 승인불가 <input type="checkbox"/> Approved with Comments 조건부 승인 Comments(주 석) :				
Reviewed by : 이원만.LEE WON-MAN 07-09-06 검토자 원자력)원자력품질관리부 Date		Approved by : 박세완.PARK SE-WAN 07-09-06 승인자 원자력)원자력품질관리부 Date		
Verification of Corrective Action 시정 조치 의 확 인 <input checked="" type="checkbox"/> Satisfactory 만족 <input type="checkbox"/> Required Re-Corrective Action(New CAR No. :)				
		Verified by : 이원만.LEE WON-MAN 07-09-11 승인자 원자력)원자력품질관리부 Date		
		Approved by : 허남열.HUR NAM-YEOL 07-09-12 승인자 원자력)원자력품질관리부 Date		

(품질보증-15200-012)

두산중공업(주)


(A4/복사용지)

 Doosan Heavy Industries & Construction		CORRECTIVE ACTION REPORT(CAR) 시정 조치 보고서		CAR NO. : CAR_080045 보고서번호 Req Reply Date : 2008-05-30 회신요구일자
To : 원자력)원자력해외PM 수신처				
PJT No : N05004 사업번호		Custome : WESTINGHOUSE 고객		
Project : Entergy RRVH Project 사업명		NCR/ADR/CAR No : 불일치/감사/시정번호		
Conditions(상태) : For Waterford 3 RRVCH and ANO 2 RRVCH, the welding material purchase specification, EPS-T08-156 Revision B and EPS-108-108 Revision A, do not meet the design specification requirement, 418A37 Revision 3 and 418A36 Revision 3. And the actual welding material used to vent pipe assembly and O-ring retainer slot repair do not meet the design specification requirement. - Design specification requirement for all austenitic stainless steel : maximum Cobalt content of 0.05 % - EPS-T08-156 Revision B and EPS-108-108 Revision A : maximum Cobalt 0.2 % - Actual : ER316L (CMTR NQC-07-094) - Cobalt content 0.10 %, ER308L (CMTR NQC-07-095) - Cobalt content 0.11 % However, this design specification violation was not approved by customer with Deviation Notice before welding operation. Recommended Corrective Action(시정조치방안) : "Report to 10 CFR 21 : () Yes, (v) No" Perform the root cause analysis and take corrective actions. - 16 June 12/28				
Prepared by : 이원만.LEE WON-MAN 08-05-20 작성자 원자력)원자력품질관리부 Date				
Cause and Corrective Action Response(원인 분석 및 시정 조치 계획) : Refer to the RCA & Corrective Action as attached.				
Responded by : 손기영. 08-05-22 Approved by : 박수영. 08-05-22 회신자 원자력)원자력해외PM Date 승인자 원자력)원자력해외PM Date <input checked="" type="checkbox"/> Approved 승인 <input type="checkbox"/> Disapproved 승인불가 <input type="checkbox"/> Approved with Comments 조건부 승인 Comments(주석) :				
Reviewed by : 이원만.LEE WON-MAN 08-05-23 Approved by : 박세완.PARK SE-WAN 08-05-23 검토자 원자력)원자력품질관리부 Date 승인자 원자력)원자력품질관리부 Date				
Verification of Corrective Action 시정 조치 의 확 인 <input checked="" type="checkbox"/> Satisfactory 만 족 <input type="checkbox"/> Required Re-Corrective Action(New CAR No. :) Verified by : 이원만.LEE WON-MAN 08-05-28 승인자 원자력)원자력품질관리부 Date Approved by : 박세완.PARK SE-WAN 08-05-28 승인자 원자력)원자력품질관리부 Date				

(품질보증-15200-012)

두산중공업(주)


(A4/복사용지)


 Doosan Heavy Industries & Construction		CORRECTIVE ACTION REPORT(CAR) 시정 조치 보고서		CAR NO. : CAR_070066 보고서번호 Req Reply Date : 2007-06-29 회신요구일자	
To : 원자력)원자로설계팀 수신처					
PJT No : N05065 사업번호			Custome : Arizona Public Service Company 고객		
Project : Palo Verde 1.2.3 RVH/CEDM 사업명			NCR/ADR/CAR No : 불일치/감사/시정번호		
Conditions(상태) : Purchase Order 2007002081 & 2007000866(Rev.0), dated on Jan. 24. 2007, required MPS No. PS-11102PV Rev.1 for PV #1.2.3 CEDM Stainless steel round bar. But after revising of PS-11102PV rev.3 as dated on Mar.15.2007. PR & PO does not revised to reflect PS-11102PV, Rev.3 <div style="text-align: right;"> " Report to 10CAR21 : () Yes. (V) No." <i>2007.6.13/28</i> </div>					
Recommended Corrective Action(시정 조치 방안) : Perform the root cause analysis and corrective action per PQAP-1603.					
Prepared by : 손진만.SON JIN-MAN 07-06-24 작 성 자 원자력)원자력품질관리부 Date					
Cause and Corrective Action Response(원인 분석 및 시정 조치 계획) : Refer to the attached root cause analysis & corrective action, the technical evaluation sheet. <div style="text-align: right;"> <i>2007.6.13/28</i> </div>					
Responded by : 전일정.JUN IL-JUNG 07-06-28 Approved by : 방상윤.BANG SANG-YOUN 07-06-28 회 신 자 원자력)원자로설계팀 Date 승 인 자 원자력)원자로설계팀 Date					
<input checked="" type="checkbox"/> Approved 승인 <input type="checkbox"/> Disapproved 승인불가 <input type="checkbox"/> Approved with Comments 조건부 승인 Comments(주 석) :					
Reviewed by : 손진만.SON JIN-MAN 07-06-28 Approved by : 박세원.PARK SE-WAN 07-06-29 경 토 자 원자력)원자력품질관리부 Date 승 인 자 원자력)원자력품질관리부 Date					
Verification of Corrective Action 시 정 조 치 의 확 인 <input checked="" type="checkbox"/> Satisfactory 만 족 <input type="checkbox"/> Required Re-Corrective Action(New CAR No. :) <div style="text-align: right;"> Verified by : 손진만.SON JIN-MAN 07-07-05 승 인 자 원자력)원자력품질관리부 Date Approved by : 허남열.HUR NAM-YEOL 07-07-05 승 인 자 원자력)원자력품질관리부 Date </div>					

(품질보증-15200-012)

두산중공업(주)

(A4/복사용지)

 Doosan Heavy Industries & Construction		CORRECTIVE ACTION REPORT(CAR) 시정 조치 보고서		CAR NO. : CAR_070108 보고서번호 Req Reply Date : 2007-10-15 회신요구일자
To : (주)경성정기 수신처				
PJT No : N06010 사업번호		Custome : Westinghouse Electric Company, 고객 : LLC.		
Project : Sequoyah #2 RSG 사업명		NCR/ADR/CAR No : 불일치/감사/시정번호		
Conditions(상태) : Prior to start of production, one spinner casting shall be subject to dimensional examination to verify compliance with the drawing. However, the production was started without customer inspection for the first part. It was observed on the first part inspection visit.(Spinner manufacturer : Howmet) Spinner 발주요건에 따라 Pre-production을 제작하여 치수검사 완료 후 본제품을 제작하여야 하나 제작사인 Howmet은 초도품에 대한 입회검사 전 본제품 제작을 시작하였음. "Report to 10CAR 21 : () Yes, () No" - 6/13/07				
Recommended Corrective Action(시정 조치방안) : Perform the Root Cause Analysis and Take Preventive Action for Recurrence. 발생원인 분석 및 향후 제발방지방안 수립.				
Prepared by : 이원만 LEE WON-MAN 07-10-05 작성자 원자력)원자력품질관리부 Date				
Cause and Corrective Action Response(원인 분석 및 시정 조치 계획) : Refer to the Root Cause Analysis & Corrective Action Report No. KS-RCA-S07001				
Responded by : 권기혁 KWEON KI-HYUG 07-10-11 Approved by : 조용현 Cho.Yonghun 07-10-11 회신자 원자력)원자력구매팀 Date 승인자 원자력)원자력구매팀 Date				
<input checked="" type="checkbox"/> Approved 승인 <input type="checkbox"/> Disapproved 승인불가 <input type="checkbox"/> Approved with Comments 조건부 승인 Comments(주석) :				
Reviewed by : 이원만 LEE WON-MAN 07-10-11 Approved by : 박세완 PARK SE-WAN 07-10-15 검토자 원자력)원자력품질관리부 Date 승인자 원자력)원자력품질관리부 Date				
Verification of Corrective Action 시정 조치 의 확 인 <input checked="" type="checkbox"/> Satisfactory 만족 <input type="checkbox"/> Required Re-Corrective Action(New CAR No. :) Verified by : 이원만 LEE WON-MAN 07-10-15 승인자 원자력)원자력품질관리부 Date Approved by : 허남열 HUR NAM-YEOL 07-10-15 승인자 원자력)원자력품질관리부 Date				
(품질보증-15200-012)		두산중공업(주)		(A4/복사용지)

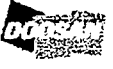
 Doosan Heavy Industries & Construction		CORRECTIVE ACTION REPORT(CAR) 시정 조치 보고서		CAR NO. : CAR_080003 보고서번호 Req Reply Date : 2008-01-22 회신요구일자
To : 원자력)원자력품질관리부 수신처				
PJT No : N06010 사업번호		Custome : Westinghouse Electric Company, LLC. 고객		
Project : Sequoyah #2 RSG 사업명		NCR/ADR/CAR No : 불일치/감사/시정번호		
Conditions(상태) : Westinghouse Project Quality Plan(S2RSG-PQP-01, Rev. 1) Appendix A require 5 days in advance notification if Westinghouse QA resident is not onsite. However, DOOSAN did not issue notifications per this requirement during the Westinghouse QA resident's absence in holidays, Dec. 25, 2007 through Jan. 02, 2008. Only 2 days in advance notification was issued for the notification number NQC-07-057 through 071 "Report to 10 CFR 21 : () Yes, (✓) No" Recommended Corrective Action(시정조치방안) : Perform the root cause analysis and take corrective action				
Prepared by : 김용철.KIM YONG-CHUL 08-01-15 작성자 원자력)원자력품질관리부 Date				
Cause and Corrective Action Response(원인 분석 및 시정 조치 계획) : Root cause analysis and corrective action was performed. See the attached RCA-CAR_080003. 2008-05-12 원자력)원자력품질관리부 주기기감사과/H111856/이원만				
Responded by : 이원만.LEE WON-MAN 08-01-17 회신자 원자력)원자력품질관리부 Date		Approved by : 손진만.SON JIN-MAN 08-01-17 승인자 원자력)원자력품질관리부 Date		
<input checked="" type="checkbox"/> Approved 승인 <input type="checkbox"/> Disapproved 승인불가 <input type="checkbox"/> Approved with Comments 조건부 승인 Comments(주석) :				
Reviewed by : 김용철.KIM YONG-CHUL 08-01-17 검토자 원자력)원자력품질관리부 Date		Approved by : 박세완.PARK SE-WAN 08-01-18 승인자 원자력)원자력품질관리부 Date		
Verification of Corrective Action 시정 조치 의 확 인 <input checked="" type="checkbox"/> Satisfactory 만 족 <input type="checkbox"/> Required Re-Corrective Action(New CAR No. :) Verified by : 김용철.KIM YONG-CHUL 08-01-18 승인자 원자력)원자력품질관리부 Date Approved by : 허남열.HUR NAM-YEOL 08-01-18 승인자 원자력)원자력품질관리부 Date				

(품질보증-15200-012)

두산중공업(주)

(A4/복사용지)

Doosan Heavy Industries & Construction	<h2 style="margin: 0;">CORRECTIVE ACTION REPORT(CAR)</h2> <h3 style="margin: 0;">시정 조치 보고서</h3>	CAR NO. : CAR_080016 보고서번호 Req Reply Date : 2008-02-06 회신요구일자
To : 원자력)원자력생산기술팀 수신처		
PJT No : N06010 사업번호	Custome : Westinghouse Electric Company. 고객 : LLC.	
Project : Sequoyah #2 RSG 사업명	NCR/ADR/CAR No : 불일치/감사/시정번호	
Conditions(상태) : 세코야 2B RSG Tubesheet to Lower shell 용접 전 Tubesheet 용접 개선후 MT 공정이 누락된 채 후속 용접작업이 진행됨 (해당 용접은 경안검사원 압입성 임). 선행 TRV(100400695, Oper. 770) 확인결과 Tubesheet 가공 후 PT 수발원관통을 확인함. - 해당 TRV 및 공정번호(Applicable TRV & Oper.) : 100422725, Oper. 30 Before Sequoyah 2B RSG Tubesheet to Lower shell welding operation, MT on Tubesheet weld preparation was missed. This operation was AHI witness point. However, it was found that tubesheet weld preparation was PT examined in the previous TRV(100400695, Oper. 770). Through further investigation.		
"Report to 10 CFR 21 : C > Yes, CV > No" - 2008.02.15/15/08		
Recommended Corrective Action(시정 조치방안) : 1. 누락된 공정에 대한 조치방안 수립 2. 선행공정인 MT 누락된 상태로 후속 용접작업 진행된 원인분석 및 재발방지 대책수립 1. Take a corrective action for the missed MT operation. 2. Performed the root cause analysis and take preventive action of recurrence.		
Prepared by : 이원만.LEE WON-MAN 08-01-28 작 성 자 원자력)원자력품질관리부 Date		
Cause and Corrective Action Response(원인 분석 및 시정 조치 계획) : 1. 원인 분석 - 작업명 : Tubesheet 용접 - 작업장 : 후속 용접 작업장 - 작업자 : 원자력)원자력생산기술팀 - 작업일 : 2008.02.15 - 작업시간 : 10:00 ~ 12:00 - 작업내용 : Tubesheet 용접 - 작업결과 : Tubesheet 용접 완료 - 작업비고 : Tubesheet 용접 완료 후 MT 공정이 누락된 채 후속 용접작업이 진행됨 2. 시정 조치 - 시정 조치 : Tubesheet 용접 완료 후 MT 공정을 수행함 - 시정 조치 결과 : Tubesheet 용접 완료 후 MT 공정 수행 완료 - 시정 조치 일자 : 2008.02.15 - 시정 조치 장소 : 원자력)원자력생산기술팀		
Responded by : 왕진민.WANG JIN-MIN 08-02-13 Approved by : 김승원.KIM SUNG-WON 08-02-14 회 신 자 원자력)원자력생산기술팀 Date 승 인 자 원자력)원자력생산기술팀 Date		
<input checked="" type="checkbox"/> Approved 승인 <input type="checkbox"/> Disapproved 승인불가 <input type="checkbox"/> Approved with Comments 조건부 승인 Comments(주 석) :		
Reviewed by : 이원만.LEE WON-MAN 08-02-14 Approved by : 박세완.PARK SE-WAN 08-02-15 검 토 자 원자력)원자력품질관리부 Date 승 인 자 원자력)원자력품질관리부 Date		
Verification of Corrective Action 시 정 조 치 의 확 인 Verified by : 이원만.LEE WON-MAN 08-02-15 Satisfactory 승 인 자 원자력)원자력품질관리부 Date 만 족		
Required Re-Corrective Action(New CAR No. :) Approved by : 박세완.PARK SE-WAN 08-02-15 승 인 자 원자력)원자력품질관리부 Date		

 Doosan Heavy Industries & Construction		CORRECTIVE ACTION REPORT(CAR) 시정 조치 보고서		CAR NO. : CAR_080040 보고서번호 Req Reply Date : 2008-04-25 회신요구일자
To : 원자력)원자력생산관리팀금창경판(주) 수신처				
PJT No : N06010 사업번호		Custome : Westinghouse Electric Company. 고객 : LLC.		
Project : Sequoyah #2 RSG 사업명		NCR/ADR/CAR No : 불일치/감사/시정번호		
Conditions(상태) : Sequoyah 2 RSG Secondary Head Knuckle 및 Dome의 성형 후 수행예정인 UT관련 절차서가 제출되어 검토결과 Comment하였으니 Comment 내용이 적절히 반영되지 않은 상태로 절차서 개정번호 변경없이 재 제출됨. - 절차서 번호 : INDT-QCP-UT-12A REV.0 (2007.12.01) - REV.0에 대한 Comment : 2008.04.08 (Comment 내용 : 오타 수정(Art.4 → Art. 5), Angle beam에 대해 주사 방향 및 수직범에 대한 교정 방법 추가) - 재 제출 일자 및 개정번호 : 2008.04.15. REV.0 제출 (Comment 내용 일부 미반영) <div style="text-align: right;">" Report to 10 CFR 21 : () Yes () No "</div> <div style="text-align: right;">4/16/08</div>				
Recommended Corrective Action(시정조치방안) : UT 절차서가 개정번호 변경없이 일부 내용만 수정되어 재 제출된 경위 파악 및 재발방지 대책 수립. 재발방지 대책에는 관련직원에 대하여 문서관리 절차 재교육 포함. 비파괴검사 관련 국제비파괴검사(주)와 금창경판(주) 및 두산중공업간의 Communication 개선 방안 수립.				
Prepared by : 이원만.LEE WON-MAN 08-04-15 작 성 자 원자력)원자력품질관리부 Date				
Cause and Corrective Action Response(원인 분석 및 시정 조치 계획) : 1. 원인분석 UT검사가 긴급하여 UT 절차서 개정번호 및 기 제출한 내용의 Comment 사항을 부분적으로 누락한 채 승인요청의뢰서 발송함 2. 재발방지 대책 절차에 따른 Revision 번호 부여 및 Comment 내용을 제대로 반영할 수 있도록 공급사 및 UT수행업체간 문서관리절차서에 따른 교육 실시 • 첨부 : - 시정 조치 및 예방조치 요구서 - 교육훈련 기록서				
Responded by : 김옥규.KIM OK-KYU 08-04-21 회 신 자 원자력)원자력생산관리팀 Date		Approved by : 이윤근. 08-04-21 승 인 자 원자력)원자력생산관리팀 Date		
<input checked="" type="checkbox"/> Approved 승인 <input type="checkbox"/> Disapproved 승인불가 <input type="checkbox"/> Approved with Comments 조건부 승인 Comments(주 석) :				
Reviewed by : 이원만.LEE WON-MAN 08-04-21 경 토 자 원자력)원자력품질관리부 Date		Approved by : 박세완.PARK SE-WAN 08-04-21 승 인 자 원자력)원자력품질관리부 Date		
Verification of Corrective Action 시 정 조 치 의 확 인 <input checked="" type="checkbox"/> Satisfactory 만족 <input type="checkbox"/> Required Re-Corrective Action(New CAR No. :)				
		Verified by : 이원만.LEE WON-MAN 08-04-28 승 인 자 원자력)원자력품질관리부 Date		
		Approved by : 박세완.PARK SE-WAN 08-04-28 승 인 자 원자력)원자력품질관리부 Date		

(품질보증-15200-012)

두산중공업(주)

(A4/복사용지)