

行政院及所屬各機關出國報告
(出國類別：其他)

龍門計畫國外製造機械設備製程中品質查驗

服務機關：台灣電力公司核能安全處
出國人職稱：主管
姓名：邱雲長
出國地區：韓國
出國期間：94年12月5日至94年12月16日
報告日期：95年1月17日

行政院及所屬各機關出國報告審核表

出國報告名稱：龍門計畫國外製造機械設備製程中品質查驗

出國計畫主辦機關名稱：台灣電力股份有限公司

出國人姓名/職稱/服務單位：邱雲長/主管/核能安全處

<p>出國計畫</p> <p>主辦機關</p> <p>審核意見</p>	<p><input checked="" type="checkbox"/> 1. 依限繳交出國報告</p> <p><input checked="" type="checkbox"/> 2. 格式完整</p> <p><input checked="" type="checkbox"/> 3. 內容充實完備。</p> <p><input type="checkbox"/> 4. 建議具參考價值</p> <p><input type="checkbox"/> 5. 送本機關參考或研辦</p> <p><input type="checkbox"/> 6. 送上級機關參考</p> <p><input type="checkbox"/> 7. 退回補正，原因：</p> <p style="margin-left: 20px;"><input type="checkbox"/> (1) 不符原核定出國計畫</p> <p style="margin-left: 20px;"><input type="checkbox"/> (2) 以外文撰寫或僅以所蒐集外文資料為內容</p> <p style="margin-left: 20px;"><input type="checkbox"/> (3) 內容空洞簡略</p> <p style="margin-left: 20px;"><input type="checkbox"/> (4) 未依行政院所屬各機關出國報告規格辦理</p> <p style="margin-left: 20px;"><input type="checkbox"/> (5) 未於資訊網登錄提要資料及傳送出國報告電子檔</p> <p><input type="checkbox"/> 8. 其他處理意見</p>
<p>層轉機關</p> <p>審核意見</p>	<p><input type="checkbox"/> 同意主辦機關審核意見</p> <p style="margin-left: 20px;"><input type="checkbox"/> 全部 <input type="checkbox"/> 部分 _____ (填寫審核意見編號)</p> <p><input type="checkbox"/> 退回補正，原因： _____ (填寫審核意見編號)</p> <p><input type="checkbox"/> 其他處理意見：</p>

說明：

- 一、 出國計畫主辦機關即層轉機關時，不需填寫「層轉機關審核意見」。
- 二、 各機關可依需要自行增列審核項目內容，出國報告審核完畢本表請自行保存。
- 三、 審核作業應於報告提出後二個月內完成。

報告人：



單位
主管



主管處
主管



總經理
副總經理

1/19

行政院及所屬各機關出國報告提要

出國報告名稱：龍門計畫國外製造機械設備製程中品質查驗

頁數 28 含附件：是 否

出國計畫主辦機關/聯絡人/電話：台灣電力公司/陳德隆(人事處)/02-23667685

出國人員姓名/服務機關/單位/職稱/電話：邱雲長/台灣電力公司/核能安全處/

主管/02-23667187

出國類別：1 考察 2 進修 3 研究 4 實習 5 其他 (洽公)

出國期間：94/12/5~94/12/16

出國地區：韓國

報告日期：95/1/17

分類號/目：

關鍵詞：

內容摘要：本項出國計畫為依據龍門計畫 ASME Sec. III 核能級管路採購合約 (8749311M01800) 之規定，對得標廠商韓國 Doosan 公司及其分包廠商 TK、Sungkwang Bend 及 Daekwang Tech. 等公司，執行核能級管件製程中品質查驗，包括停留檢驗點及見證檢驗點之執行、製造程序之查證、材料之標示、包裝與儲存之查證、不符合事項之處理、裝運前之最終檢驗及相關品質紀錄之審查等。查驗結果除有 43 支管節之品質紀錄，發現有一些疏失外，其他均能符合採購規範品質要求。本次查驗所發現之品質紀錄疏失事項，廠商均已立即配合改正完成。

龍門計畫國外製造機械設備製程中品質查驗

摘 要

本項出國計畫為依據龍門計畫 ASME Sec. III 核能級管路採購合約 (8749311M01800) 之規定，對得標廠商韓國 Doosan 公司及其分包廠商 TK、Sungkwang Bend 及 Daekwang Tech. 等公司，執行核能級管件製程中品質查驗，包括停留檢驗點及見證檢驗點之執行、製造程序之查證、材料之標示、包裝與儲存之查證、不符合事項之處理、裝運前之最終檢驗及相關品質紀錄之審查等。查驗結果除有 43 支管節之品質紀錄，發現有一些疏失外，其他均能符合採購規範品質要求。本次查驗所發現之品質紀錄疏失事項，廠商均已立即配合改正完成。

龍門計畫國外製造機械設備製程中品質查驗

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陸、附件

附件一：品質查驗工作相關照片

附件二：品質查驗工作相關規範、標準及程序書

附件三：Product Quality Certificate(PQC)

附件四：Name Plate 鐳道化學成份分析結果

壹、出國任務說明

本項出國計畫為依據龍門計畫 ASME Sec. III核能級管路採購合約 (8749311M01800)之規定，對得標廠商韓國 Doosan 公司及其分包廠商 TK、Sungkwang Bend 及 Daekwang Tech. 等公司，執行核能級管件製程中品質查驗，包括停留檢驗點及見證檢驗點之執行、製造程序之查證、材料之標示、包裝與儲存之查證、不符合事項之處理、裝運前之最終檢驗及相關品質紀錄之審查等。

貳、出國行程

94.12.5 ~ 94.12.5	台北 ---- 釜山 ---- 昌原	往 程
94.12.6 ~ 94.12.8	昌原 Doosan 公司	執行品質查驗 (8日公畢往釜山)
94.12.9 ~ 94.12.15	釜山 Sungkwang、TK、 Daekwang 公司	執行品質查驗
94.12.16 ~ 94.12.16	釜山 ----- 台北	返 程

參、核能級管件製程中品質查驗工作報告

一、查驗項目及數量

本次查驗項目及數量包括：

Unit 1 Shop fabricated pipe(BOP) : 78 pieces
Loose Part (BOP) : Lug : 48 pieces , Plug : 36 pieces
Jack Screw Bolt/Nut : 18 sets

Unit 2 Shop fabricated pipe(BOP) : 6 pieces
6% moly straight welded pipe(BOP) : 147 pieces
Loose Part (BOP) : Lug : 48 pieces

二、查驗廠商及方式

本次查驗廠商及其主要作業項目包括：

1. Doosan 公司(合約廠商): Shop fabricated pipe

2. TK 公司(分包廠商): 5D bend 6% moly welded pipe
3. Sungkwang 公司(分包廠商): Small bore Fitting
4. Daekwang 公司(分包廠商): Cleaning & packing service

查驗進行方式，主要包括：

1. 查驗相關文件及其修訂情況。
2. 查證核能級管件之製造、標識、儲存、清潔和 Shipping Preparation 狀況。
3. 審查核能級管件之品質文件及紀錄之正確、完整性。

三、查驗相關文件及其修訂情況

與 Doosan 公司之 Mr.Seon-Kon Ryu 查對目前工作依據之相關文件，主要包括：

1. TPC-Doosan Contract 8749311M01800
2. Procurement Spec. for Shop Fabricated Piping—ASME III, Class 2,3(Spec. No.874-M0029,Rev.5, Amendment No.2)
3. Procurement Spec. for 50mm and Smaller Piping and Fittings—ASME III, Class 1,2,3(Spec. No. 31113.62.2220,Rev.4, Amendment No.1)
4. Doosan 公司 QA Manual (QM-200, Rev.6)
5. Inspection and Test Plan (874-M0029, Rev.5)
6. Inspection and Test Plan (31113.62.2220, Rev.1)
7. Sub-contractors' Inspection and Test Plan (Rev.1)
8. QA Record list(Rev.0)
9. 相關規範、標準及程序書(詳附件二)

四、至 94.12.15 之核能級管件製造進度如下：

1. BOP 部份：

(1) Shop fabricated pipe(包括 2.5D/5D Bend pipe)：

	<u>一號機</u>	<u>二號機</u>	<u>總計</u>
Total Spools：	611	613	1224
PQC Issued：	539(88%)	126(21%)	665(54%)
Shipped：	461(75%)	120(20%)	581(47%)

(2)：6% moly straight welded pipe：

	<u>一號機</u>	<u>二號機</u>	<u>總計</u>
Total Spools：	690	591	1281

PQC Issued :	690(100%)	371(63%)	1061(83%)
Shipped :	690(100%)	224(38%)	914(74%)

2. BONI 部份 :

(1) Pipe :

	<u>一號機</u>	<u>二號機</u>	<u>總計</u>
Total Q'ty(m) :	20374	20374	40748
PQC Issued :	20374(100%)	20374(100%)	40748(100%)
Shipped :	20374(100%)	20374(100%)	40748(100%)

(1) Fitting :

	<u>一號機</u>	<u>二號機</u>	<u>總計</u>
Total Pieces :	5428	5428	10856
PQC Issued :	5428(100%)	5428(100%)	10856(100%)
Shipped :	5428(100%)	5428(100%)	10856(100%)

五、製程中品質查驗工作概述

1. Shop fabricated pipe 部分 :

- (1) 現場抽查 Spool No: 2W12LSA5002Y1-1, 2W12LSF5017Y1-1, 2W12LSD5011Y1-1, 2W12LSB5005Y1-1, 2W12LSC5008Y1-1, 2W12LSE5014Y1-1 等管節之製造, Pipe 對 90° Elbow 之鐸道及 PT 已完成, 正準備鐸 Name Plate。核對 Weld No., Welder ID., Spool Dwg., Shop Traveler 之製造紀錄, PT Report 及 PT 檢驗人員資格等, 均無不符合情況發現。
- (2) 現場抽查 Spool No.1P26LSD5009Y1-8 管節 Flange(Item 1)對 Pipe(Item 2)之鐸接, 母材材質、所使用之鐸材、鐸接人員資格等, 均符合要求。

2. Main Steam Manifold 部分, Unit 1 已製造完成並交運。Unit 2 之 Body 及 Nozzle 對 Body 之鐸接工作均已完成, 目前運入 RT Room 進行鐸道 RT 檢驗, 預定 12/22 進行水壓試驗。

3. 對管節、管件 Stamping, Cleaning, Coating, Marking, 及 Shipping Preparation 之查驗情形 :

- (1) Shop fabricated pipe、5D bend 6% moly welded pipe、及 6% moly straight welded pipe 等共 231 支管節。100% 查對每支管節標識, 包括: Code Nameplate, Spool No., NPT Stamp 等, 查驗結果全部管節均按照規定標識。另依照 ITP 規定, 隨機抽驗 11

支管節(不超過5%)，要求廠商拆除包裝做 Dimension、Inside Surface Condition、Packing Condition 之目視檢查。檢查結果無不符合情況發現，各管節均經清潔、乾燥後，於管內放入乾燥劑，管端蓋上 Cap 並以膠帶密封，整支管節再裝入塑膠袋中密封，貼上 ID Marking 及附上 Packing List，以木框固定，放置於露天儲存場，上面覆蓋防雨膠布等候交運。

(2) Loose Part (Lug)：Unit 1 及 Unit 2 各 48 件。100% 檢查 Lug 之規格、標識及 Packing Condition。檢查結果均按規定標識 (ASME SB688, Heat No.818638, A12-2/A13-2)；包裝按 Unit 1 及 Unit 2 分開各裝入 1 只鋪設塑膠布之大木箱中，並放入乾燥劑，以膠帶密封，貼上 ID Marking 及附上 Packing List，儲存於工場內等候交運，未發現有不合情況。

(3) Loose Part (Jack Screw Bolt/Nut & Plug)：Unit 1 部份之 Jack Screw Bolt/Nut 共 18 組，Plug 共 36 件。100% 檢查 Bolt/Nut 及 Plug 之規格、標識及 Packing Condition。檢查結果均按規定標識 (Bolt/Nut：ASME SA193-B6/SA194-6, 19x108L；Plug：ASME SA182-F316, D21.3x30L)。包裝則每一組 Bolt/Nut 裝入塑膠袋中以膠帶密封，貼上 ID Marking，再裝入 1 只大木箱中，附上 Packing List，儲存於工場內等候交運，未發現有不合情況。

六、審查核能級管件之品質紀錄文件

審查各核能級管節、管件之 QRP(Quality Record Package)，包括：Certificate of Conformance, Code Data Report, CMTR, NDE Reports, Dimension Inspection Report, Shop Traveler, As-built Drawing, NUC/NCR, ... 等，總計審查 Shipment No.32~36 共 5 份 Product Quality Certificate(PQC)所包含之 231 支管節、150 件管件之品質紀錄文件(詳附件三)。審查結果除下列 QRP 發現有疏失外，其餘 Package 均無不符合狀況發現。有問題之 QRP 並均已於本次查驗工作期間完成改正。

1. Spool No. 1P13LSX5038Y1-1, 1P13LSX5038Y1-5, 1P13LSX5038Y2-1, 1P13LSX5038Y2-9, 1P13LSX5039Y1-2 等 5 支管節，缺鐸道 RT 檢驗發現缺陷之鐸接修補紀錄。(已將鐸接修補紀錄補記入 Shop Traveler 中)
2. Spool No. 1P13LSX5038Y1-1~5, 1P13LSX5038Y2-1~9, 1P13LSX5038Y3-1~6, 1P13LSX5039Y1-1~3, 1P13LSX5040Y1-1~3, 1P13LSX5041Y1-1~3, 等 29 支管節，缺

Name Plate 之 CMTR。(已將所缺之 CMTR 補附入 QRP 中)

3. Spool No. 1W12LSF5018Y2-1, 缺 Name Plate 之 CMTR; 而 Page 32 及 33 為兩張相同之鐸材 CMTR。(Page 33 已抽換為 Name Plate 之 CMTR)
4. Spool No. 1BP21LSA5001-3, Page 47, Shop Traveler 記載之鐸接完成日期(10/28)比 RT 檢驗日期(10/25)還晚, 不合常理。(鐸接完成日期經查證後更正為 10/24)
5. Spool No. 1B21LSA5004-4, Page 3, FORM NPP-1 之"Description of Piping"欄, 漏列 Small Pipe、Bend Pipe、Reducer 及 Sockolet 等項目。(已補列)
6. Spool No. 1B21ANC-5801, 1B21ANC-5803, 1B21GUD-5802, 1B21GUD-5804, 等 4 支碳鋼管節, 發現 Shop Traveler 上所記載之管節對接鐸道, 及鐸接 Name Plate 所使用的鐸材, 其 Lot No. 均為 009388。經查該批號鐸材為 ER70S-6 之碳鋼鐸材, 而鐸接 Name Plate 則需使用 ER309L 之不鏽鋼鐸材。(經 Doosan 製作兩種試件(Samp A: 使用 ER309L 之不鏽鋼鐸材鐸接 Name Plate; Samp B: 使用 ER70S-6 碳鋼鐸材鐸接 Name Plate), 利用手提式金屬化學成份分析儀(METALSCAN-1625)對 4 支管節及兩種試件之 Name Plate 鐸道進行化學成份分析, 分析結果如附件四。依據鎳(Ni)、鉻(Cr)、鐵(Fe)成份之百分比, 確認前述 4 支管節鐸接 Name Plate 所使用的鐸材無誤, 只是 Shop Traveler 將鐸材之 Lot No. 誤植, 於是同意 Doosan 直接更正 Shop Traveler 上之鐸材 Lot No.)
7. Spool No. 1P26LSU5039Y1-8, 1P26LSU5039Y1-9, 1P26LSD5009Y1-8, 1P26LSD5009Y1-9, 1P26LSM5026Y1-8, 1P26LSM5026Y1-9 等 6 支管節, Shop Traveler 之"Acid Cleaning" 及"Final Inspection" 為 QC Hold Point, 但無 QC 人員簽章。(已補送 QC 查證及簽章)
8. Spool No. 2P26LSP5031Y11-2, Page 3, FORM NPP-1 之"Commissions"欄空白未填寫。(已送 ANI 補填)

七、與 Doosan 討論安排今後派員執行品質查驗工作問題。

1. 有關後續品質查驗工作之安排, 經參照交運計畫並與 Doosan 相關人員討論後, 預定仍須於 95 年 1 月、3 月、5 月派員執行 3 次檢驗工作。

2. Doosan 預定 12/22 執行 Unit 2 Manifold 水壓試驗，要求台電派員配合檢驗。經表達台電不同意僅為此一項工作而派人，希望 Doosan 能將其延至與 95 年 1 月的檢驗工作一併執行。Doosan 同意將再與相關部門研商延後問題。(本項檢驗工作，後來 Doosan 雖將其延至 1 月 4 日，但仍無法與 1 月份排定的檢驗日期 1/16~1/27 合併執行。經考量相同的 Unit 1 Manifold 水壓試驗，台電已派員做過一次檢驗，故建議免除本項檢驗，並已經簽陳核准。)

肆、出國期間所遭遇之困難與特殊事項

無。

伍、心得與建議

- 一、本次品質查驗顯示，Doosan 對 QRP 整理工作，雖然仍有許多缺失，但與之前的情況比較，已大有進步。
- 二、由石威派員執行之 11 月份品質查驗工作，檢驗員已依照本處建議的改進措施，包括對未違反合約要求亦不影響品質的事情，避免簽發 NUC；不再在 QRP 的每一頁文件上簽章；積極主動掌握檢驗工作進度，如期完成工作，故已沒有要求延長檢驗時間的問題發生。

陸、附錄

- 附件一：品質查驗工作相關照片 (共 3 頁)
- 附件二：品質查驗工作相關規範、標準及程序書 (共 1 頁)
- 附件三：Product Quality Certificate(PQC) (共 13 頁)
- 附件四：Name Plate 鐸道化學成份分析結果 (共 1 頁)

【附件一】



現場檢查 Shop
Fabricated Pipe 之
Name Plate 銲接
作業



現場檢查 Shop
Fabricated Pipe 與
Flange 銲道之銲
接作業



查對 Unit 2 Main
Steam Manifold 之銲
道表面研磨情況



檢查管節之
包裝情況



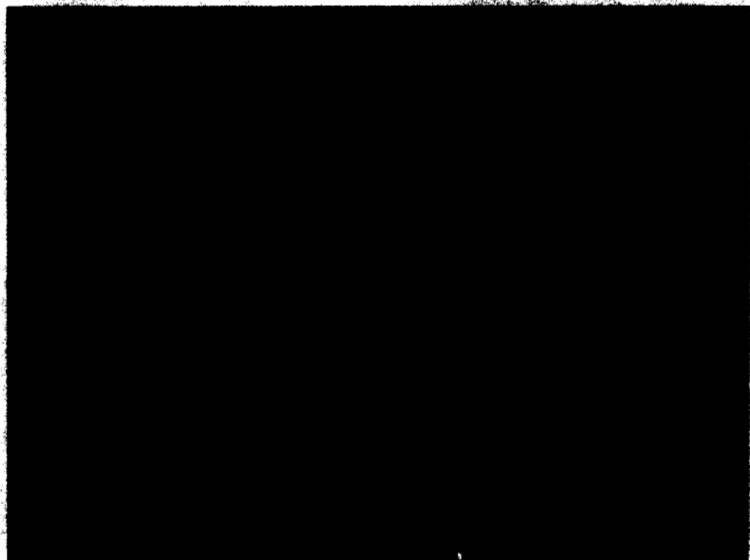
檢查管節之內部
清潔情況



檢查管節之 Weld
End Preparation



檢查 Loose Part (Lug)
之尺寸及標識



檢查 Loose Part (Jack
Screw Bolt/Nut)之尺寸
及標識



對管節之 Name
Plate 鐸道進行化
學成份分析

Submittal Status(date format: mm-dd)													
rev.0	sis	rev.1	sis	rev.2	sis	rev.3	sis	rev.4	sis	rev.5	sis	rev.6	sis
04-26	05-25												
05-25		06-21		07-09				05-16		07-04	07-21		
06-21	07-08	11-04	11-05										
06-21		07-26	08-03										
06-21		07-26	08-03										
06-15		10-29	11-05										
06-15		10-29	11-05										
06-15		10-29	11-05										
06-15		02-14	02-25										
07-02		08-12	09-24	02-14	03-15								
07-02		08-12	09-24										
07-02		08-12	09-24				05-13	06-25					
		10-04											
				02-18	04-07	04-08							
03-29													
		03-24											
02-25		07-04											
05-02													
04-01													
04-01													
04-01													
04-01													
04-01													
04-01													
04-01													

No.	Doc. No. 1	Doc. No. 2	Title	Rev	STS	Dept	Remark
L1	Doc. No. 1 : PjI 문서번호이며, 형식은 "82055.MS018.X-xxxx"임. ""=82055.MS018."						
L2	Doc. No. 2 : Manufacturer's 문서번호						
L3	STS : Status(고객 검토 결과)						
1	QM-200	QA Manual(Controlled Copy)		6	1	OA	
2	*4-00001	(ITP) Inspection and Test Plan		5	1	품질	
3	*4-00003	(ITP) ITP for Small Bore and Fittings		1	1	품질	
4	*4-00004	Quality Record List		0	1	품질	
5	*4-00005	PSAHCPCGH0003	Hydrostatic Test Procedure	1	1	품질	
6	*4-00006	PSAHCPCGFA0001	Wall Thickness measure. Procedure	1	1	품질	
7	*4-00002	PS-LM-RT001	NDE Procedure(RT)	1	1	NDE	
8	*4-00007	PS-LM-MT001	NDE Procedure(MT)	1	1	NDE	
9	*4-00008	PS-LM-PT001	NDE Procedure(PT)	1	1	NDE	
10	*4-00009	PS-LM-UT001	NDE Procedure(UT)	1	1	NDE	
11	*8-02004	PSAHCPCGW0004	WPS and PQR	2	1	기술	
12	*8-02005	PSAHCPCGRE0004	Welding/Welding Repair Proc.	1	1	기술	
13	*8-02006	PSAHCPCGHA0004	PWHT Specification	1	1	기술	
14	*8-02002	PSZMAACL0001	Cleaning procedure(Large Bore)	3	1	이하	
15	*8-02007		Cleaning procedure(small bore)	1	1	이하	
16	*8-02009	PSAZMAAPT0001	Painting Procedure(Large Bore)	3	1	이하	
17	*8-02011		Painting Procedure(Small Bore)	3	1	이하	
18	*8-02008	PSAHCPCPS0004	Packing procedure(874-M0029)	1	1	이하	
19	(28)		Bending Procedure			이하	
20			PFI Code (ES-24)			설계	
21	*5-02001-15		Fabrication Standard Details	2,3,5	1	설계	
22	*8-02039	PSAHCPCGW0005	WPS and PQR	0		기술	
23	*8-02029	PSAHCPCGFS0005	Packing procedure for Small Bore	1		이하	
24							
1	*8-02044	PSAHCPCGKA0002	Marking Procedure	1	1	기술	
2		WIAHCPCPK0001	Repacking after Internal Inspection for 6% Moly	0	1	기술	
3		PSAHCPCGZA0005	소모성 자재 관리 절차서	0	1	기술	
4		WI-00P-RP-001	C/S, A/S 임시부착물 부착 및 제거 지침서	0	1	기술	
5		WI-98P-GE-001	스테인레스강 용접 작업 지침서	0	1	기술	
6		WI-99P-GA-001	Ar Gas Back Purging 작업	0	1	기술	
7		WI-99P-FA-001	S/S 배관 Temporary Piece 부착/제거 작업지침	0	1	기술	
8		WI-91P-FA-002	배관 Butt Weld Joint의 가공 및 Fit-up 작업기준	0	1	기술	
1			Hot/Cold Bending & Forming Procedure				
2							
3			Filler Metal Control Procedure				
4			Welder Qualification Procedure				



**LUNG MEN PROJECT
RELEASE FOR SHIPMENT**

Product Quality Certificate

CLIENT: Taiwan Power Company	TPC CONTRACT NO. 8749311M01800	SHIPMENT NO. 32
TPC SPECIFICATION NO. 874-MS-018(874-M-0029)	REV. 5	ADDENDA
PRODUCT DESCRIPTION Shop Fabricated ASME III Piping(All Size)		
<u>SUPPLIER'S CERTIFICATION</u>		
I HEREBY CERTIFY THAT THE PRODUCT(S) IDENTIFIED HEREIN HAVE BEEN MANUFACTURED UNDER A CONTROLLED PROGRAM AND ARE IN COMPLIANCE WITH THE APPLICABLE CODES, STANDARDS AND SPECIFICATIONS LISTED IN TPC PURCHASE SPECIFICATION REQUIREMENT.		
<u>Description</u>	<u>Q'ty</u>	<u>Unit</u>
<u>Packing List No.</u>	<u>Remark</u>	
Fabricated Pipe Spools	16 pcs	1
LM-MS018-033	-	
ALL SUPPORTING DOCUMENTATION REQUIRED BY THE ABOVE REFERENCED DOCUMENTS HAVE BEEN ISSUED TO TPC AUTHORIZED REPRESENTATIVE.		
SIGNED <i>M. K. Kim</i>	DATE <i>Dec. 9, 2005</i>	
TITLE <i>General Manager</i>	SUPPLIER <i>Doosan Heavy Industries & Construction Co., Ltd.</i>	
<u>TPC REPRESENTATIVE CERTIFICATION¹</u>		
THIS IS TO CERTIFY THAT EVIDENCE SUPPORTING THE ABOVE SUPPLIERS' CERTIFICATION STATEMENT HAS BEEN REVIEWED AND THAT NO DEVIATIONS FROM QUALITY ASSURANCE REQUIREMENTS HAVE BEEN FOUND UNLESS NOTED BELOW."		
SIGNED <i>J. C. Chion</i>	DATE <i>Dec. 9, 2005</i>	
TITLE <i>QA Representative</i>	RFA NO. <i>---</i>	
DEVIATIONS/NONCONFORMANCES FROM PURCHASE ORDER REQUIREMENTS		

1 - The TPC representative's certification does not release the supplier from their responsibility to provide work products that are acceptable under the contract nor does it preclude TPC's right to reject nonconforming work.

Section 4. List of Supplied Spools

Packing List No. : LM-MS018-033

S/N	Drawing No	Rev	Spool No	Doosan No
1	82055.MS018. 5-1200946	3	1B21LSA5001-3	DN-1310
2	82055.MS018. 5-1200950	2	1B21LSA5002-3	DN-1314
3	82055.MS018. 5-1200954	2	1B21LSA5003-3	DN-1318
4	82055.MS018. 5-1200958	2	1B21LSA5004-3	DN-1634
5	82055.MS018. 5-1200959	2	1B21LSA5004-4	DN-1635
6	82055.MS018. 5-1200961	2	1B21LSA5006-2	DN-1637
7	82055.MS018. 5-1200963	1	1B21LSA5006-4	DN-1639
8	82055.MS018. 5-1200966	2	1B21LSA5007-3	DN-1642
9	82055.MS018. 5-1200968	1	1B21LSA5007-5	DN-1644
10	82055.MS018. 5-1200972	1	1B21LSA5008-4	DN-1648
11	82055.MS018. 5-1200974	2	1B21LSA5009-2	DN-1650
12	82055.MS018. 5-1200976	1	1B21LSA5009-4	DN-1652
13	82055.MS018. 5-1200977	1	1B21-ANC-5803	DN-2635
14	82055.MS018. 5-1200978	1	1B21-ANC-5801	DN-2636
15	82055.MS018. 5-1200979	0	1B21-GUD-5804	DN-2637
16	82055.MS018. 5-1200980	1	1B21-GUD-5802	DN-2638

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LUNGMEN PROJECT
RELEASE FOR SHIPMENT

Product Quality Certificate

CLIENT: Taiwan Power Company	TPC CONTRACT NO. 8749311M01800	SHIPMENT NO. 33		
TPC SPECIFICATION NO. 874-MS-018(874-M-0029)	REV. 5	ADDENDA		
PRODUCT Shop Fabricated ASME III Piping(All Size)				
DESCRIPTION				
SUPPLIER'S CERTIFICATION				
I HEREBY CERTIFY THAT THE PRODUCT(S) IDENTIFIED HEREIN HAVE BEEN MANUFACTURED UNDER A CONTROLLED PROGRAM AND ARE IN COMPLIANCE WITH THE APPLICABLE CODES, STANDARDS AND SPECIFICATIONS LISTED IN TPC PURCHASE SPECIFICATION REQUIREMENT.				
<u>Description</u>	<u>Q'ty</u>	<u>Unit</u>	<u>Packing List No.</u>	<u>Remark</u>
Fabricated Pipe Spools	29 pcs	1	LM-MS018-034	-
ALL SUPPORTING DOCUMENTATION REQUIRED BY THE ABOVE REFERENCED DOCUMENTS HAVE BEEN ISSUED TO TPC AUTHORIZED REPRESENTATIVE.				
SIGNED <i>M.K. Kim</i>	DATE <i>Dec. 9, 2005</i>			
TITLE General Manager	SUPPLIER Doosan Heavy Industries & Construction Co., Ltd.			
TPC REPRESENTATIVE CERTIFICATION¹				
THIS IS TO CERTIFY THAT EVIDENCE SUPPORTING THE ABOVE SUPPLIERS' CERTIFICATION STATEMENT HAS BEEN REVIEWED AND THAT NO DEVIATIONS FROM QUALITY ASSURANCE REQUIREMENTS HAVE BEEN FOUND UNLESS NOTED BELOW."				
SIGNED <i>Z. C. Chion</i>	DATE <i>Dec. 9, 2005</i>			
TITLE <i>QA Representative</i>	RFA NO. ---			
DEVIATIONS/NONCONFORMANCES FROM PURCHASE ORDER REQUIREMENTS				

1 - The TPC representative's certification does not release the supplier from their responsibility to provide work products that are acceptable under the contract nor does it preclude TPC's right to reject nonconforming work.

Section 4. List of Supplied Spools

Packing List No. : LM-MS018-034

S/N	Drawing No	Rev	Spool No	Doosan No
1	82055.MS018. 5-1201246	0	1P13LSX5038Y1-1	DN-1661
2	82055.MS018. 5-1201247	0	1P13LSX5038Y1-2	DN-1662
3	82055.MS018. 5-1201248	0	1P13LSX5038Y1-3	DN-1663
4	82055.MS018. 5-1201249	0	1P13LSX5038Y1-4	DN-1664
5	82055.MS018. 5-1201250	0	1P13LSX5038Y1-5	DN-1665
6	82055.MS018. 5-1201251	0	1P13LSX5038Y2-1	DN-1666
7	82055.MS018. 5-1201252	0	1P13LSX5038Y2-2	DN-1667
8	82055.MS018. 5-1201253	0	1P13LSX5038Y2-3	DN-1668
9	82055.MS018. 5-1201254	0	1P13LSX5038Y2-4	DN-1669
10	82055.MS018. 5-1201255	0	1P13LSX5038Y2-5	DN-1670
11	82055.MS018. 5-1201256	0	1P13LSX5038Y2-6	DN-1671
12	82055.MS018. 5-1201257	0	1P13LSX5038Y2-7	DN-1672
13	82055.MS018. 5-1201258	0	1P13LSX5038Y2-8	DN-1673
14	82055.MS018. 5-1201259	0	1P13LSX5038Y2-9	DN-1674
15	82055.MS018. 5-1201260	0	1P13LSX5038Y3-1	DN-1675
16	82055.MS018. 5-1201261	0	1P13LSX5038Y3-2	DN-1676
17	82055.MS018. 5-1201262	0	1P13LSX5038Y3-3	DN-1688
18	82055.MS018. 5-1201263	0	1P13LSX5038Y3-4	DN-1677
19	82055.MS018. 5-1201264	1	1P13LSX5038Y3-5	DN-1689
20	82055.MS018. 5-1201265	0	1P13LSX5038Y3-6	DN-1678
21	82055.MS018. 5-1201266	0	1P13LSX5039Y1-1	DN-1679
22	82055.MS018. 5-1201267	0	1P13LSX5039Y1-2	DN-1680
23	82055.MS018. 5-1201268	1	1P13LSX5039Y1-3	DN-1681
24	82055.MS018. 5-1201269	0	1P13LSX5040Y1-1	DN-1682
25	82055.MS018. 5-1201270	0	1P13LSX5040Y1-2	DN-1683
26	82055.MS018. 5-1201271	1	1P13LSX5040Y1-3	DN-1684
27	82055.MS018. 5-1201272	0	1P13LSX5041Y1-1	DN-1685
28	82055.MS018. 5-1201273	0	1P13LSX5041Y1-2	DN-1686
29	82055.MS018. 5-1201274	1	1P13LSX5041Y1-3	DN-1687

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LUNGMEN PROJECT
RELEASE FOR SHIPMENT

Product Quality Certificate

CLIENT: Taiwan Power Company	TPC CONTRACT NO. 8749311M01800	SHIPMENT NO. 34		
TPC SPECIFICATION NO. 874-MS-018(874-M-0029)	REV. 5	ADDENDA		
PRODUCT Shop Fabricated ASME III Piping(All Size)				
DESCRIPTION				
SUPPLIER'S CERTIFICATION				
I HEREBY CERTIFY THAT THE PRODUCT(S) IDENTIFIED HEREIN HAVE BEEN MANUFACTURED UNDER A CONTROLLED PROGRAM AND ARE IN COMPLIANCE WITH THE APPLICABLE CODES, STANDARDS AND SPECIFICATIONS LISTED IN TPC PURCHASE SPECIFICATION REQUIREMENT.				
<u>Description</u>	<u>Q'ty</u>	<u>Unit</u>	<u>Packing List No.</u>	<u>Remark</u>
Fabricated Pipe Spools	15 pcs	1	LM-MS018-035	-
Loose Part - Lug	48 pcs			
ALL SUPPORTING DOCUMENTATION REQUIRED BY THE ABOVE REFERENCED DOCUMENTS HAVE BEEN ISSUED TO TPC AUTHORIZED REPRESENTATIVE.				
SIGNED <i>M. K. Kim</i>	DATE <i>Dec. 9, 2005</i>			
TITLE General Manager	SUPPLIER Doosan Heavy Industries & Construction Co., Ltd.			
TPC REPRESENTATIVE CERTIFICATION¹				
THIS IS TO CERTIFY THAT EVIDENCE SUPPORTING THE ABOVE SUPPLIERS' CERTIFICATION STATEMENT HAS BEEN REVIEWED AND THAT NO DEVIATIONS FROM QUALITY ASSURANCE REQUIREMENTS HAVE BEEN FOUND UNLESS NOTED BELOW.*				
SIGNED <i>Z. C. Chion</i>	DATE <i>Dec. 9, 2005</i>			
TITLE <i>QA Representative</i>	RFA NO. ---			
DEVIATIONS/NONCONFORMANCES FROM PURCHASE ORDER REQUIREMENTS				

1 - The TPC representative's certification does not release the supplier from their responsibility to provide work products that are acceptable under the contract nor does it preclude TPC's right to reject nonconforming work.

Section 4. List of Supplied Spools

Packing List No. : LM-MS018-035

S/N	Drawing No	Rev	Spool No	Doosan No
1	82055.MS018. 5-1201175	2	1P26LSB5004Y2-3	DN-235
2	82055.MS018. 5-1201187	2	1P26LSH5017Y2-3	DN-246
3	82055.MS018. 5-1201199	2	1P26LSP5030Y2-3	DN-257
4	82055.MS018. 5-1201235	0	1P26LSB5005Y1-3	DN-1654
5	82055.MS018. 5-12500	2	1P26LSU5039Y1-9	DN-1406
6	82055.MS018. 5-12501	2	1P26LSU5039Y1-8	DN-1407
7	82055.MS018. 5-12572	1	1P26LSB5005Y31-1	DN-1656
8	82055.MS018. 5-12632	1	1P26LSH5018Y34-10	DN-1659
9	82055.MS018. 5-12634	1	1P26LSH5018Y34-8	DN-1660
10	82055.MS018. 5-12640	1	1P26LSH5018Y34-2	DN-1657
11	82055.MS018. 5-12641	1	1P26LSH5018Y34-1	DN-1658
12	82055.MS018. 5-12709	2	1P26LSD5009Y1-9	DN-1485
13	82055.MS018. 5-12710	1	1P26LSD5009Y1-8	DN-1486
14	82055.MS018. 5-12777	2	1P26LSM5026Y1-9	DN-1498
15	82055.MS018. 5-12778	1	1P26LSM5026Y1-8	DN-1499
16	Loose Parts - Lug 48 pieces(24 pcs for A12-2 and 24 pcs for A13-2)			

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LUNGMEN PROJECT
RELEASE FOR SHIPMENT

Product Quality Certificate

CLIENT: Taiwan Power Company	TPC CONTRACT NO. 8749311M01800	SHIPMENT NO. 35		
TPC SPECIFICATION NO. 874-MS-018(874-M-0029)	REV. 5	ADDENDA		
PRODUCT Shop Fabricated ASME III Piping(All Size)				
DESCRIPTION				
SUPPLIER'S CERTIFICATION				
I HEREBY CERTIFY THAT THE PRODUCT(S) IDENTIFIED HEREIN HAVE BEEN MANUFACTURED UNDER A CONTROLLED PROGRAM AND ARE IN COMPLIANCE WITH THE APPLICABLE CODES, STANDARDS AND SPECIFICATIONS LISTED IN TPC PURCHASE SPECIFICATION REQUIREMENT.				
<u>Description</u>	<u>Q'ty</u>	<u>Unit</u>	<u>Packing List No.</u>	<u>Remark</u>
Fabricated Pipe Spools	153 pcs	2	LM-MS018-036	-
Loose Part - Lug	48 pcs			
ALL SUPPORTING DOCUMENTATION REQUIRED BY THE ABOVE REFERENCED DOCUMENTS HAVE BEEN ISSUED TO TPC AUTHORIZED REPRESENTATIVE.				
SIGNED <i>M. K. Kim</i>	DATE <i>Dec. 9, 2005</i>			
TITLE General Manager	SUPPLIER Doosan Heavy Industries & Construction Co., Ltd.			
TPC REPRESENTATIVE CERTIFICATION¹				
THIS IS TO CERTIFY THAT EVIDENCE SUPPORTING THE ABOVE SUPPLIERS' CERTIFICATION STATEMENT HAS BEEN REVIEWED AND THAT NO DEVIATIONS FROM QUALITY ASSURANCE REQUIREMENTS HAVE BEEN FOUND UNLESS NOTED BELOW."				
SIGNED <i>F. C. Chiu</i>	DATE <i>Dec. 9, 2005</i>			
TITLE <i>QA Representative</i>	RFA NO. ---			
DEVIATIONS/NONCONFORMANCES FROM PURCHASE ORDER REQUIREMENTS				

1 - The TPC representative's certification does not release the supplier from their responsibility to provide work products that are acceptable under the contract nor does it preclude TPC's right to reject nonconforming work.

Section 4. List of Supplied Spools

Packag List No. : LM-MS018-036

S/N	Drawing No	Rev	Spool No	Doosan No
1	82055.MS018. 5-2200064	0	2P26LSB5005Y15-1	DN-2034
2	82055.MS018. 5-2200108	0	2P26LSB5005Y22-3	DN-2079
3	82055.MS018. 5-2200116	1	2P26LSB5005Y23-6	DN-2084
4	82055.MS018. 5-2200117	0	2P26LSH5018Y2-1	DN-2185
5	82055.MS018. 5-2200118	0	2P26LSH5018Y2-2	DN-2192
6	82055.MS018. 5-2200119	0	2P26LSH5018Y2-3	DN-2195
7	82055.MS018. 5-2200120	1	2P26LSH5018Y2-4	DN-2200
8	82055.MS018. 5-2200121	0	2P26LSH5018Y2-5	DN-2201
9	82055.MS018. 5-2200124	0	2P26LSH5018Y3-1	DN-2202
10	82055.MS018. 5-2200125	0	2P26LSH5018Y3-2	DN-2203
11	82055.MS018. 5-2200126	0	2P26LSH5018Y3-3	DN-2204
12	82055.MS018. 5-2200127	0	2P26LSH5018Y3-4	DN-2205
13	82055.MS018. 5-2200128	0	2P26LSH5018Y3-5	DN-2206
14	82055.MS018. 5-2200129	0	2P26LSH5018Y4-1	DN-2207
15	82055.MS018. 5-2200130	0	2P26LSH5018Y4-2	DN-2208
16	82055.MS018. 5-2200131	0	2P26LSH5018Y4-3	DN-2209
17	82055.MS018. 5-2200132	0	2P26LSH5018Y4-4	DN-2210
18	82055.MS018. 5-2200133	0	2P26LSH5018Y4-5	DN-2211
19	82055.MS018. 5-2200134	0	2P26LSH5018Y5-1	DN-2212
20	82055.MS018. 5-2200135	0	2P26LSH5018Y5-2	DN-2213
21	82055.MS018. 5-2200136	0	2P26LSH5018Y5-3	DN-2214
22	82055.MS018. 5-2200137	0	2P26LSH5018Y5-4	DN-2215
23	82055.MS018. 5-2200138	0	2P26LSH5018Y5-5	DN-2216
24	82055.MS018. 5-2200139	0	2P26LSH5018Y6-1	DN-2217
25	82055.MS018. 5-2200140	0	2P26LSH5018Y6-2	DN-2218
26	82055.MS018. 5-2200141	0	2P26LSH5018Y6-3	DN-2219
27	82055.MS018. 5-2200142	0	2P26LSH5018Y6-4	DN-2220
28	82055.MS018. 5-2200143	0	2P26LSH5018Y6-5	DN-2221
29	82055.MS018. 5-2200144	0	2P26LSH5018Y7-1	DN-2222
30	82055.MS018. 5-2200145	0	2P26LSH5018Y7-2	DN-2223
31	82055.MS018. 5-2200146	0	2P26LSH5018Y7-3	DN-2224
32	82055.MS018. 5-2200152	0	2P26LSH5018Y8-1	DN-2226
33	82055.MS018. 5-2200153	0	2P26LSH5018Y8-2	DN-2227
34	82055.MS018. 5-2200154	0	2P26LSH5018Y8-3	DN-2228
35	82055.MS018. 5-2200155	0	2P26LSH5018Y8-4	DN-2229
36	82055.MS018. 5-2200156	0	2P26LSH5018Y8-5	DN-2230
37	82055.MS018. 5-2200157	0	2P26LSH5018Y8-6	DN-2231
38	82055.MS018. 5-2200158	0	2P26LSH5018Y9-1	DN-2232
39	82055.MS018. 5-2200159	0	2P26LSH5018Y9-2	DN-2233
40	82055.MS018. 5-2200160	0	2P26LSH5018Y9-3	DN-2234
41	82055.MS018. 5-2200161	0	2P26LSH5018Y9-4	DN-2235
42	82055.MS018. 5-2200162	0	2P26LSH5018Y9-5	DN-2236
43	82055.MS018. 5-2200163	0	2P26LSH5018Y9-6	DN-2237
44	82055.MS018. 5-2200187	0	2P26LSH5018Y13-6	DN-2147
45	82055.MS018. 5-2200191	0	2P26LSH5018Y15-1	DN-2149
46	82055.MS018. 5-2200217	0	2P26LSH5018Y19-3	DN-2175
47	82055.MS018. 5-2200218	0	2P26LSH5018Y19-4	DN-2176
48	82055.MS018. 5-2200219	0	2P26LSH5018Y19-5	DN-2177
49	82055.MS018. 5-2200220	0	2P26LSH5018Y19-6	DN-2178
50	82055.MS018. 5-2200221	0	2P26LSH5018Y20-1	DN-2179

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Packing List No. : LM-MS018-036

S/N	Drawing No	Rev	Spool No	Doosan No
51	82055.MS018. 5-2200222	0	2P26LSH5018Y20-2	DN-2180
52	82055.MS018. 5-2200223	0	2P26LSH5018Y20-3	DN-2181
53	82055.MS018. 5-2200224	0	2P26LSH5018Y20-4	DN-2182
54	82055.MS018. 5-2200225	0	2P26LSH5018Y20-5	DN-2183
55	82055.MS018. 5-2200226	0	2P26LSH5018Y20-6	DN-2184
56	82055.MS018. 5-2200227	0	2P26LSH5018Y21-1	DN-2186
57	82055.MS018. 5-2200228	0	2P26LSH5018Y21-2	DN-2187
58	82055.MS018. 5-2200229	0	2P26LSH5018Y21-3	DN-2188
59	82055.MS018. 5-2200230	0	2P26LSH5018Y21-4	DN-2189
60	82055.MS018. 5-2200231	0	2P26LSH5018Y21-5	DN-2190
61	82055.MS018. 5-2200232	0	2P26LSH5018Y21-6	DN-2191
62	82055.MS018. 5-2200233	0	2P26LSH5018Y22-1	DN-2193
63	82055.MS018. 5-2200235	0	2P26LSH5018Y22-3	DN-2194
64	82055.MS018. 5-2200239	0	2P26LSH5018Y23-1	DN-2196
65	82055.MS018. 5-2200240	0	2P26LSH5018Y23-2	DN-2197
66	82055.MS018. 5-2200244	1	2P26LSH5018Y23-6	DN-2199
67	82055.MS018. 5-2200247	0	2P26LSP5031Y3-1	DN-2311
68	82055.MS018. 5-2200248	0	2P26LSP5031Y3-2	DN-2312
69	82055.MS018. 5-2200249	0	2P26LSP5031Y3-3	DN-2313
70	82055.MS018. 5-2200250	0	2P26LSP5031Y3-4	DN-2314
71	82055.MS018. 5-2200287	0	2P26LSP5031Y10-1	DN-2238
72	82055.MS018. 5-2200288	0	2P26LSP5031Y10-2	DN-2239
73	82055.MS018. 5-2200289	0	2P26LSP5031Y10-3	DN-2240
74	82055.MS018. 5-2200290	0	2P26LSP5031Y10-4	DN-2241
75	82055.MS018. 5-2200291	0	2P26LSP5031Y10-5	DN-2242
76	82055.MS018. 5-2200292	0	2P26LSP5031Y10-6	DN-2243
77	82055.MS018. 5-2200293	0	2P26LSP5031Y11-1	DN-2244
78	82055.MS018. 5-2200294	0	2P26LSP5031Y11-2	DN-2245
79	82055.MS018. 5-2200295	0	2P26LSP5031Y11-3	DN-2246
80	82055.MS018. 5-2200296	0	2P26LSP5031Y11-4	DN-2247
81	82055.MS018. 5-2200297	0	2P26LSP5031Y11-5	DN-2248
82	82055.MS018. 5-2200298	0	2P26LSP5031Y11-6	DN-2249
83	82055.MS018. 5-2200299	0	2P26LSP5031Y12-1	DN-2250
84	82055.MS018. 5-2200300	0	2P26LSP5031Y12-2	DN-2251
85	82055.MS018. 5-2200301	0	2P26LSP5031Y12-3	DN-2252
86	82055.MS018. 5-2200302	0	2P26LSP5031Y12-4	DN-2253
87	82055.MS018. 5-2200303	0	2P26LSP5031Y12-5	DN-2254
88	82055.MS018. 5-2200306	0	2P26LSP5031Y13-1	DN-2255
89	82055.MS018. 5-2200307	0	2P26LSP5031Y13-2	DN-2256
90	82055.MS018. 5-2200308	0	2P26LSP5031Y13-3	DN-2257
91	82055.MS018. 5-2200309	0	2P26LSP5031Y13-4	DN-2258
92	82055.MS018. 5-2200310	0	2P26LSP5031Y13-5	DN-2259
93	82055.MS018. 5-2200312	0	2P26LSP5031Y14-1	DN-2260
94	82055.MS018. 5-2200313	0	2P26LSP5031Y14-2	DN-2261
95	82055.MS018. 5-2200316	0	2P26LSP5031Y15-1	DN-2262
96	82055.MS018. 5-2200317	0	2P26LSP5031Y15-2	DN-2263
97	82055.MS018. 5-2200318	0	2P26LSP5031Y15-3	DN-2264
98	82055.MS018. 5-2200319	0	2P26LSP5031Y15-4	DN-2265
99	82055.MS018. 5-2200320	0	2P26LSP5031Y15-5	DN-2266
100	82055.MS018. 5-2200321	0	2P26LSP5031Y15-6	DN-2267

12.9.05

Packing List No. : LM-MS018-036

S/N	Drawing No	Rev	Spool No	Doosan No
101	82055.MS018. 5-2200322	0	2P26LSP5031Y16-1	DN-2268
102	82055.MS018. 5-2200323	0	2P26LSP5031Y16-2	DN-2269
103	82055.MS018. 5-2200324	0	2P26LSP5031Y16-3	DN-2270
104	82055.MS018. 5-2200325	0	2P26LSP5031Y16-4	DN-2271
105	82055.MS018. 5-2200326	0	2P26LSP5031Y16-5	DN-2272
106	82055.MS018. 5-2200327	0	2P26LSP5031Y16-6	DN-2273
107	82055.MS018. 5-2200328	0	2P26LSP5031Y17-1	DN-2274
108	82055.MS018. 5-2200329	0	2P26LSP5031Y17-2	DN-2275
109	82055.MS018. 5-2200330	0	2P26LSP5031Y17-3	DN-2276
110	82055.MS018. 5-2200331	0	2P26LSP5031Y17-4	DN-2277
111	82055.MS018. 5-2200332	0	2P26LSP5031Y17-5	DN-2278
112	82055.MS018. 5-2200333	0	2P26LSP5031Y17-6	DN-2279
113	82055.MS018. 5-2200334	0	2P26LSP5031Y18-1	DN-2280
114	82055.MS018. 5-2200335	0	2P26LSP5031Y18-2	DN-2281
115	82055.MS018. 5-2200336	0	2P26LSP5031Y18-3	DN-2282
116	82055.MS018. 5-2200337	0	2P26LSP5031Y18-4	DN-2283
117	82055.MS018. 5-2200338	0	2P26LSP5031Y18-5	DN-2284
118	82055.MS018. 5-2200339	0	2P26LSP5031Y18-6	DN-2285
119	82055.MS018. 5-2200340	0	2P26LSP5031Y19-1	DN-2286
120	82055.MS018. 5-2200341	0	2P26LSP5031Y19-2	DN-2287
121	82055.MS018. 5-2200342	0	2P26LSP5031Y19-3	DN-2288
122	82055.MS018. 5-2200343	0	2P26LSP5031Y19-4	DN-2289
123	82055.MS018. 5-2200344	0	2P26LSP5031Y19-5	DN-2290
124	82055.MS018. 5-2200345	0	2P26LSP5031Y19-6	DN-2291
125	82055.MS018. 5-2200346	0	2P26LSP5031Y20-1	DN-2292
126	82055.MS018. 5-2200347	0	2P26LSP5031Y20-2	DN-2293
127	82055.MS018. 5-2200348	0	2P26LSP5031Y20-3	DN-2294
128	82055.MS018. 5-2200349	0	2P26LSP5031Y20-4	DN-2295
129	82055.MS018. 5-2200350	0	2P26LSP5031Y20-5	DN-2296
130	82055.MS018. 5-2200351	0	2P26LSP5031Y20-6	DN-2297
131	82055.MS018. 5-2200352	0	2P26LSP5031Y21-1	DN-2298
132	82055.MS018. 5-2200353	0	2P26LSP5031Y21-2	DN-2299
133	82055.MS018. 5-2200354	0	2P26LSP5031Y21-3	DN-2300
134	82055.MS018. 5-2200355	0	2P26LSP5031Y21-4	DN-2301
135	82055.MS018. 5-2200356	0	2P26LSP5031Y21-5	DN-2302
136	82055.MS018. 5-2200357	0	2P26LSP5031Y21-6	DN-2303
137	82055.MS018. 5-2200358	0	2P26LSP5031Y22-1	DN-2304
138	82055.MS018. 5-2200360	0	2P26LSP5031Y22-3	DN-2305
139	82055.MS018. 5-2200363	0	2P26LSP5031Y23-1	DN-2307
140	82055.MS018. 5-2200364	0	2P26LSP5031Y23-2	DN-2308
141	82055.MS018. 5-2200367	1	2P26LSP5031Y23-5	DN-2310
142	82055.MS018. 5-2200386	0	2P26LSB5005Y26-4	DN-2397
143	82055.MS018. 5-2200388	0	2P26LSB5005Y26-6	DN-2399
144	82055.MS018. 5-2200440	0	2P26LSD5009Y6-4	DN-2425
145	82055.MS018. 5-2200475	0	2P26LSH5018Y26-4	DN-2439
146	82055.MS018. 5-2200489	0	2P26LSH5018Y27-13	DN-2584
147	82055.MS018. 5-2200532	0	2P26LSM5026Y6-3	DN-2464
148	82055.MS018. 5-2200546	0	2P26LSM5026Y7-13	DN-2600
149	82055.MS018. 5-2200579	0	2P26LSP5031Y26-4	DN-2479
150	82055.MS018. 5-2200636	1	2P26LSU5039Y6-4	DN-2506
151	82055.MS018. 5-2200662	2	2P26LSB5002Y2-1	DN-291
152	82055.MS018. 5-2200668	2	2P26LSB5004Y2-3	DN-298

12-9-05

Packing List No. : LM-MS018-036

S/N	Drawing No	Rev	Spool No	Doosan No
153	82055.MS018. 5-2200677	2	2P26LSH5017Y2-3	DN-306
154	Loose Parts - Lug 48 pieces(24 pcs for A12-2 and 24 pcs for A13-2)			

12-9-05



LUNG MEN PROJECT
RELEASE FOR SHIPMENT

Product Quality Certificate

CLIENT: Taiwan Power Company	TPC CONTRACT NO. 8749311M01800	SHIPMENT NO. 36																				
TPC SPECIFICATION NO. 874-MS-018(874-M-0029)	REV. 5	ADDENDA																				
PRODUCT Shop Fabricated ASME III Piping(All Size)																						
DESCRIPTION																						
SUPPLIER'S CERTIFICATION																						
I HEREBY CERTIFY THAT THE PRODUCT(S) IDENTIFIED HEREIN HAVE BEEN MANUFACTURED UNDER A CONTROLLED PROGRAM AND ARE IN COMPLIANCE WITH THE APPLICABLE CODES, STANDARDS AND SPECIFICATIONS LISTED IN TPC PURCHASE SPECIFICATION REQUIREMENT.																						
<table><thead><tr><th>Description</th><th>Q'ty</th><th>Unit</th><th>Packing List No.</th><th>Remark</th></tr></thead><tbody><tr><td>Fabricated Pipe Spools</td><td>18 pcs</td><td>1</td><td>LM-MS018-037</td><td>-</td></tr><tr><td>- Jack Screw Bolt/Nut</td><td>18 sets</td><td></td><td></td><td></td></tr><tr><td>- Plug</td><td>36 pcs</td><td></td><td></td><td></td></tr></tbody></table>			Description	Q'ty	Unit	Packing List No.	Remark	Fabricated Pipe Spools	18 pcs	1	LM-MS018-037	-	- Jack Screw Bolt/Nut	18 sets				- Plug	36 pcs			
Description	Q'ty	Unit	Packing List No.	Remark																		
Fabricated Pipe Spools	18 pcs	1	LM-MS018-037	-																		
- Jack Screw Bolt/Nut	18 sets																					
- Plug	36 pcs																					
ALL SUPPORTING DOCUMENTATION REQUIRED BY THE ABOVE REFERENCED DOCUMENTS HAVE BEEN ISSUED TO TPC AUTHORIZED REPRESENTATIVE.																						
SIGNED <i>M.K. Kim</i>	DATE <i>Dec. 9, 2005</i>																					
TITLE General Manager	SUPPLIER Doosan Heavy Industries & Construction Co., Ltd.																					
TPC REPRESENTATIVE CERTIFICATION¹																						
THIS IS TO CERTIFY THAT EVIDENCE SUPPORTING THE ABOVE SUPPLIERS' CERTIFICATION STATEMENT HAS BEEN REVIEWED AND THAT NO DEVIATIONS FROM QUALITY ASSURANCE REQUIREMENTS HAVE BEEN FOUND UNLESS NOTED BELOW."																						
SIGNED <i>F. C. Chion</i>	DATE <i>Dec. 9, 2005</i>																					
TITLE <i>QA Representative</i>	RFA NO. ---																					
DEVIATIONS/NONCONFORMANCES FROM PURCHASE ORDER REQUIREMENTS																						

1 - The TPC representative's certification does not release the supplier from their responsibility to provide work products that are acceptable under the contract nor does it preclude TPC's right to reject nonconforming work.

Section 4. List of Supplied Spools

Packing List No. : LM-MS018-037

S/N	Drawing No	Rev	Spool No	Doosan No
1	82055.MS018. 5-1201275	1	1W12LSA5088Y1-1	DN-1363
2	82055.MS018. 5-1201284	1	1W12LSA5089Y1-1	DN-1370
3	82055.MS018. 5-1201293	1	1W12LSA5090Y1-1	DN-1377
4	82055.MS018. 5-1201302	1	1W12LSA5091Y1-1	DN-1384
5	82055.MS018. 5-1201311	1	1W12LSA5092Y1-1	DN-1391
6	82055.MS018. 5-1201320	1	1W12LSA5093Y1-1	DN-1398
7	82055.MS018. 5-12854	1	1W12LSA5003Y2-1	DN-1512
8	82055.MS018. 5-12855	0	1W12LSA5003Y3-1	DN-1513
9	82055.MS018. 5-12870	2	1W12LSB5006Y2-1	DN-1528
10	82055.MS018. 5-12871	0	1W12LSB5006Y3-1	DN-1529
11	82055.MS018. 5-12886	1	1W12LSC5009Y2-1	DN-1544
12	82055.MS018. 5-12887	0	1W12LSC5009Y3-1	DN-1545
13	82055.MS018. 5-12902	1	1W12LSD5012Y2-1	DN-1560
14	82055.MS018. 5-12903	0	1W12LSD5012Y3-1	DN-1561
15	82055.MS018. 5-12918	1	1W12LSE5015Y2-1	DN-1576
16	82055.MS018. 5-12919	0	1W12LSE5015Y3-1	DN-1577
17	82055.MS018. 5-12934	1	1W12LSF5018Y2-1	DN-1592
18	82055.MS018. 5-12935	0	1W12LSF5018Y3-1	DN-1593
19	Note 1.			

[Note] 1. For the above 18 spools, jack screw bolt/nut 1set and plug 2 pieces for each spool were included in this shipment separately.
The related inspection documents were prepared in serial no. 19.

邱雲長
12-9-05

08-Dec'05 16:22
 Automatic
 316 SS
 Cr 18.1
 Mo 2.09
 Ni 7.52
 Mn 1.19
 Cu 0.13
 Ti< 0.1
 Si 0.52
 U 0.18
 Co< 0.2
 Fe 70.1
 Nb<.06
 W < 1. S.S.T

SAMPLE-A

08-Dec'05 16:24
 Automatic
 Low Alloy
 Cr 3.19
 Mo 0.31
 Ni 2.40
 Mn 1.61
 Cu 0.20
 Ti .0530
 Si 0.45
 Al<.02
 V <.02
 Co<.02
 Fe 91.7
 Nb<.01
 Sn .0664
 Pb< 0.1 C.S

SAMPLE-B

DN 2635
 08-Dec'05 16:40
 Automatic
 304 SS
 Cr 19.3
 Mo 0.39
 Ni 15.9
 Mn 1.31
 Cu 0.11
 Ti< 0.1
 Si 0.46
 V 0.17
 Co< 0.2
 Fe 62.2
 Nb<.06
 W < 1.

08-Dec'05 16:12
 Automatic
 316 SS
 Cr 20.8
 Mo 2.04
 Ni 6.75
 Mn 1.14
 Cu 0.15
 Ti< 0.1
 Si 0.37
 U .0975
 Co< 0.2
 Fe 68.6
 Nb<.06
 W < 1.

DN-2636

08-Dec'05 16:21
 Automatic
 316 SS
 Cr 18.9
 Mo 3.05
 Ni 6.47
 Mn 1.09
 Cu 0.16
 Ti< 0.1
 Si 0.34
 U .0891
 Co< 0.2
 Fe 69.8
 Nb<.06
 W < 1.

DN 2637

08-Dec'05 16:16
 Automatic
 316 SS
 Cr 19.9
 Mo 1.56
 Ni 6.82
 Mn 1.17
 Cu 0.16
 Ti< 0.1
 Si 0.53
 U 0.11
 Co< 0.2
 Fe 69.6
 Nb<.06
 W < 1.

DN 2638

Name Plate 鐳道化學成份分析結果