

行政院及所屬各機關出國報告
(出國類別：其他)

龍門計劃國外製造機械、儀電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：核能工程監
姓名：羅士貴
出國地區：德國、西班牙
出國期間：94年10月17日~94年10月28日
報告日期：94年11月29日

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、儀電設備製程中品質查驗

頁數 48 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：羅士貴/台灣電力公司/核能安全處/
核能工程監/02-23667199

出國類別：1 考察2 進修3 研究4 實習5 其他

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報告日期：94/11/29

分類號/目

關鍵詞：龍門計畫、品質查驗

內容摘要：本項出國計畫為依據龍門計畫採購合約規定，派員赴國外機械、儀電設備製造廠家執行製程中品質查驗，本次任務為分別赴（一）MS040「Reactor Building Cranes and Auxiliary Fuel Building Crane」採購案之廠家 NKM Noell GmbH.（二）MS039「Balance of Plant Liquid Sampling & Analysis System Equipment」採購案之廠家 TELVENT (SAINCO)等機械設備製造廠家，執行製程中品質查驗。機械設備製程中之品質查驗，包括停留檢驗點及查證檢驗點之執行、製造程序之查證、持續性品質文件及紀錄之審查、品質偏差（不符合報告）處理之審查、材料之收料檢驗、標示之審查查證及廠家品質查驗時程通知之申請與安排，以及倉儲期執行相關之維護檢查等品質查證作業。

本文電子檔已傳至出國報告資訊網 (<http://report.gsn.gov.tw>)

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(出國類別：其他)

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服務機關：台灣電力公司核能安全處
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龍門計劃國外製造機械、儀電設備製程中品質查驗

摘 要

本項出國計畫為依據龍門計畫採購合約規定，派員赴國外機械、儀電設備製造廠家執行製程中品質查驗，本次任務為分別赴(一)MS040「Reactor Building Cranes and Auxiliary Fuel Building Crane」採購案之廠家 NKM Noell GmbH. (二) MS039「Balance of Plant Liquid Sampling & Analysis System Equipment」採購案之廠家 TELVENT (SAINCO)等機械設備製造廠家，執行製程中品質查驗。機械設備製程中之品質查驗，包括停留檢驗點及查證檢驗點之執行、製造程序之查證、持續性品質文件及紀錄之審查、品質偏差(不符合報告)處理之審查、材料之收料檢驗、標示之審查查證及廠家品質查驗時程通知之申請與安排，以及倉儲期執行相關之維護檢查等品質查證作業。

龍門計劃國外製造機械、儀電設備製程中品質查驗

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壹、出國任務說明

本項出國計畫為依據龍門計畫採購合約規定，派員赴國外機械、儀電設備製造廠家執行製程中品質查驗，本次任務為分別赴(一) MS040「Reactor Building Cranes and Auxiliary Fuel Building Crane」採購案之廠家 NKM Noell GmbH。(二) MS039「Balance of Plant Liquid Sampling & Analysis System Equipment」採購案之廠家 TELVENT 等機械設備製造廠家，執行製程中品質查驗。機械設備製程中之品質查驗，包括停留檢驗點及查證檢驗點之執行、製造程序之查證、持續性品質文件及紀錄之審查、品質偏差(不符合報告)處理之審查、材料之收料檢驗、標示之審查查證及廠家品質查驗時程通知之申請與安排，以及倉儲期執行相關之維護檢查等品質查證作業。

貳、出國行程

| | | |
|-------------------|--------------------------|--------|
| 94.10.17~94.10.18 | 台北-阿姆斯特丹-Wuerzburg | 往 程 |
| 94.10.19~94.10.21 | 德國 NKM Noell GmbH 公司 | 執行品質查驗 |
| 94.10.22~94.10.22 | Wuerzburg—Madrid—Sevilla | 路 程 |
| 94.10.23~94.10.25 | 西班牙 TELVENT(SAINCO)公司 | 執行品質查驗 |
| 94.10.26~94.10.28 | Sevilla-Madrid-阿姆斯特丹-台北 | 返 程 |

參、品質查驗工作報告

一、MS040「Reactor Building Cranes and Auxiliary Fuel Building Crane」採購案

1. 查驗方式

- 龍門計畫 MS040「Reactor Building Cranes and Auxiliary Fuel Building Crane」採購案，採購合約為 8749011M04000，採購規範為 Spec. No. 31113.61.1210 Rev.4 Amendment 2，Quality

Class 爲 R-1。本採購案之設備爲：

- ◆ 2 sets of Reactor Building Crane-150 tons (Tag No. 1/2F31-CRN-0001)
- ◆ 1 set of Auxiliary Fuel Building Crane-150 tons (Tag No. 0F31-CRN-0001)
- ◆ 2 sets of Hatch Hoist in Room 420-8 tons (Tag No. 1/2F31-HOI-0021)
- ◆ 2 sets of Hatch Hoist in Room 430-8tons (Tag No. 1/2F31-HOI-0021)

得標廠家爲德國 NKM Noell Special Cranes GmbH，本採購案主要之設備 Trolley of Reactor Building Crane Unit 1 & Unit 2、Trolley of Auxiliary Fuel Building Crane 及 Trolley of Hatch Hoist，由其 Sub-supplier 捷克之 KPS 公司製造及組裝（屬外購外製），Trolley 之製造及組裝範圍包括：Fabrication of trolley frames, rope drum, bottom blocks, shaft, axles and miscellaneous machinery equipment, assembly of trolley and cabling on trolley workshop test 等作業；而本採購案 Crane 及 Hatch Hoist 之 Main Girders (如：Steel bridge、Crane Rails) 及 Electrical Wiring 等，則由台灣中船公司承製（屬外購內製）。

- 本採購案由於龍門施工處 Reactor Building and Auxiliary Fuel Building 之廠房施工進度落後，無法如期提供廠商安裝吊車，因此經本公司與廠家 NKM 溝通討論後，NKM 建議外製部份之設備於製造完成後，將設備儲存於德國以減低長期儲存於工地之風險，並於完成各項品質查驗後，支付廠家 80%設備款以利其資金周轉之要求；經龍門施工處與核火工處研討及評估後同意廠家之提議，並執行合約之修訂展延安裝日期、增列設備倉儲前 PQC 簽署規定、儲存期間廠家對設備之檢查

及維護規定、修訂付款條件及交運前相關檢驗、PQC 簽署、品質文件紀錄提送之規定等合約變更。

- 有關設備倉儲期之維護檢查及設備交運之文件提送，經本公司與 NKM 協議後決議為：在倉儲期廠家必須負責定期檢查，執行必要之維護及其他保護儲存設備之措施，以防其受損。廠家應提送 Special Storage Requirement 送 TPC/S&W 審查，經同意後，確時依規定執行維護檢查，必要時 TPC/S&W 得派員前往檢查。倉儲後設備交運時，廠家須提送之文件為：Packing List、倉儲前之全部品質文件、Bill of Lading(B/L) or Airway Bill、儲存前所核發之 PQC、交貨前所核發之 PQC (Release for Shipment)、儲存期間之維護檢查紀錄並附照片。

- 本次執行設備品質查驗之方式，主要為查驗製造廠家在設備儲存期間，是否確時依據 Special Storage Requirement 之規定，執行定期維護檢查以防設備受損，並查驗留存之設備維護檢查紀錄及相關照片。(Special Storage Requirement 詳附件一)

- 依據文件
 1. Specification No. 31113.61.1210 Rev.4, Amendment 1 Rev.3
 2. Special Storage requirement (No.27015.MS040.06-020007 Rev.0)
 3. Quality Plan-Europe fabrication (No.27015.MS040.04-020006 Rev.1)
 4. Quality Record List EU-RBC (No.27015.MS040.04-021503 Rev.1)
 5. Quality Record List EU-AFBC (No.27015.MS040.04-021602 Rev.0)
 6. Quality Record List EU-Hatch Hoist (No.27015.MS040.04-021701 Rev.0)

- NKM Noell 公司查驗接洽人員：

Mr. Karl Manger (Project Manager)

Mr. Peter Wolf (Quality Control Manager)

LOXXESS WareCare GmbH 倉儲管理員

2. 查驗結果

- 本採購案之外製設備已於 2004 年 12 月 4 日，在其 Sub-supplier 捷克之 KPS 公司製造完成，並簽妥倉儲前之 PQC (Product Quality Certificate)；製造完成之設備其中 Reactor Building Crane 及 Auxiliary Fuel Building Crane 等 3 台之 Trolley，因設備較大以塑膠厚帆布覆蓋以防銹蝕及防灰塵，其他較小之組件如：Trolley 之 Attachment 及 Bottom Blocks，以及 Hatch Hoist 等設備，則在設備上擺放乾隆劑後，以鋁皮包覆並予以真空密封包裝，放入 9 個 20 呎之貨櫃 (Container) 固定妥，之後全部設備均運往廠家 NKM 總公司 (位於德國 Wuerzburg) 以西約 20 公里之 LOXXESS WareCare GmbH 專業倉儲公司之倉庫儲存，廠家並應按 Special Storage Requirement 之規定，執行每 3 個月及 6 個月之倉儲檢查，並記載留存相關檢查紀錄。
- 經由 NKM 公司之 Mr. Karl Manger (Project Manager) 及 Mr. Peter Wolf (Quality Control Manager) 及 LOXXESS 值班人員陪同赴倉庫，共同檢查儲存設備；本採購案之 3 台 Trolley 及 9 個貨櫃存放於倉庫一隅。經檢視 Reactor Building Crane 及 Auxiliary Fuel Building Crane 之 3 台 Trolley，以塑膠厚帆布覆蓋存放，9 個 20 呎貨櫃則兩個貨櫃互疊擺放於 3 台 Trolley

旁，9 個貨櫃內存放之設備分別如下：

No. 1：RBC Unit 1-Trolley Attachments(Container ID：286770-2)

No. 2：RBC Unit 1-Bottom Blocks(Container ID：385386-1)

No. 3：RBC Unit 2-Trolley Attachments(Container ID：211516-2)

No. 4：RBC Unit 2- Bottom Blocks(Container ID：434413-3)

No. 5：AFC- Bottom Blocks(Container ID：217875-3)

No. 6：RB Unit 1-Hatch Hoist Room 420(Container ID：852506-3)

No. 7：RB Unit 1-Hatch Hoist Room 430(Container ID：217069-1)

No. 8：RB Unit 2-Hatch Hoist Room 420(Container ID：245068-7)

No. 9：RB Unit 2-Hatch Hoist Room 430(Container ID：212493-1)

➤ 經掀開覆蓋在一、二號機 Reactor Building Crane Trolley 及 Auxiliary Fuel Building Crane Trolley 之塑膠厚帆布後，檢查發現 Trolley 未有損傷之情況，設備表面亦很乾淨整潔，組件表面黃色之噴漆看起來亦頗鮮艷，另 Gearbox 部份亦無漏油現象，整體來說儲存之 Trolley 狀況尚稱良好，儲存之環境亦甚佳。

➤ 經開啓貨櫃編號 245068-7，其內儲存之設備為編號 2F31-HOI-0020 之 Unit 2 Hatch Hoist for Room 420，經檢查發現 Hatch Hoist 無損傷之情況，設備表面亦很乾淨整潔，設備上放置多個大袋型之乾燥劑；再開啓貨櫃編號 211516-2 設備編號為 2F31-CRN-0001 Unit 2 Reactor Building Crane 之 Trolley Attachments，經檢查設備亦無損傷銹蝕之情況。

前述兩個貨櫃開啓後內部存放之設備，其包封之鋁皮已撕開露出設備，此為廠家執行定期檢查設備時撕開之故。

經再開啓編號 852506-3、217069-1 及 212493-1 之三個貨櫃，

發現貨櫃內設備仍以鋁皮包封未撕開檢查，廠家說明因撕開兩個貨櫃內設備之鋁皮包封檢查，未發現設備有損傷銹蝕之情況，但因設備鋁皮撕開後必須在工廠才能施做鋁皮包封作業，故廠家評估認為不破壞鋁皮之包裝，對設備儲存防銹效果較佳，經討論後同意廠家之說明；經檢查三個貨櫃設備之外包鋁皮未發現有損傷之現象。

另四個疊在上層編號 286770-2、385386-1、434413-3 及 217875-3 之貨櫃，則未開貨櫃檢查。

- 經查視 LOXXESS 倉儲公司倉庫之空調設施，均有溫濕度控制，其辦公室平時有工作人員及值班人員駐守；據稱德國名車 Benz 及 BMW 零組件亦是該倉庫之長期客戶，再加上因 LOXXESS 倉庫位於歐洲大陸中部，溫度適中氣候較乾燥等，因此發現 Reactor Building Crane 之 Trolley 雖僅以塑膠厚帆布覆蓋儲存，但儲存至今已十個多月了經檢視設備之表面，感覺色澤還很鮮艷，故本採購案設備之在德國做長期儲存實為明智且為優良的儲存場所。

- 赴德國 NKM 總公司審查設備儲存期之維護檢查紀錄，依據 Special Storage Requirement 之規定，廠家應執行每 3 月及 6 月之維護檢查，經查 NKM 均能按照 Special Storage Requirement 之規定執行維護檢查，並留存維護紀錄（詳附件二）及相關照片；惟其提出之“Corrosion Protection Report inside Main Gear Boxes”是以德文撰寫，廠家未依合約規定文件紀錄應以英文版本提出，經要求廠家改正並獲同意將轉成以英文記載。

- 經查驗本採購案 QRP 之內容，廠家均能依據 QRL 之規定製成品質成套文件，石威公司 Inspector 執行 Final Record Review 時，在 Record 每頁 Stamped 之審查紀錄亦頗完整，廠家 QRP 檔案之維護管理亦做得頗完整。
- 有關 MS040 “Reactor Building Cranes and Auxiliary Fuel Building Crane”採購案之倉儲期維護檢查現場作業情況之照片詳附件三。

二、MS039 「Balance of Plant Liquid Sampling & Analysis System Equipment」採購案

1. 查驗方式

- 龍門計畫 MS039 「Balance of Plant Liquid Sampling & Analysis System Equipment」採購案，採購合約為 8749011M03900，採購規範為 Specification No.874-M0059 Revision No.3，Quality Class 為 R-3，採購之設備如下：
 1. Remote Sampling Cooler Panels Unit 1 & 2 (一、二機各十一台，Tag No.為 1G62-CLR-5002A~5002L 及 2G62-CLR- 5002A ~ 5002L)
 2. Analyzer Panel Unit 1 & 2 (一、二機各 4 台) 其設備名稱及 Tag No.分別如下：
 - ◆ Analyzer Panel of Turbine Sampling System Unit 1 & 2 (1G62-SPL-5001B & 2G62-SPL-5001B)
 - ◆ Analyzer Panel of Condenser Sampling System Unit 1 & 2 (1G62-SPL-5010B & 2G62-SPL-5010B)
 - ◆ Analyzer Panel of Condensate Polishing Sampling System Unit 1 & 2 (1G62-SPL-5004B & 2G62-SPL-5004B)
 - ◆ Analyzer Panel of Auxiliary Boiler Sampling System Unit 1 & 2 (1G62-SPL-5007B & 2G62-SPL-5007B)
 3. Sampling Conditioning Rack of Turbine Sampling System Unit 1 & 2 (1G62-SPL-5001A & 2G62-SPL-5001A)

4. Sampling Conditioning Rack of Condensate Polishing Sampling System Unit 1 & 2 (1G62-SPL-5004A & 2G62-SPL-5004A)
5. Sampling Conditioning Rack of Auxiliary Boiler Sampling System Unit 1 & 2 (1G62-SPL-5007A & 2G62-SPL-5007A)
6. Sampling Conditioning Rack of Condenser Sampling System Unit 1 & 2 (1G62-SPL-5010A & 2G62-SPL-5010A)
7. Chiller Equipment Panel of Turbine Sampling System Unit 1 & 2 (1G62-SPL-5003 & 2G62-SPL-5003)
8. Chiller Equipment Panel of Condensate Polishing Sampling System Unit 1 & 2 (1G62-SPL-5006 & 2G62-SPL-5006)
9. Control & Recorder Panel of Turbine Sampling System Unit 1 & 2 (1G62-SPL-5002 & 2G62-SPL-5002)
10. Control & Recorder Panel of Condensate Polishing Sampling System Unit 1 & 2 (1G62-SPL-5005 & 2G62-SPL-5005)
11. Control & Recorder Panel of Auxiliary Boiler Sampling System Unit 1 & 2 (1G62-SPL-5008 & 2G62-SPL-5008)
12. Control & Recorder Panel of Condenser Sampling System Unit 1 & 2 (1G62-SPL-5011 & 2G62-SPL-5011)

- MS039 採購案由西班牙 TELVENT 公司得標，再下包給 INABENSA 公司（INABENSA 公司是一家非常有名的 Panel 專業製造廠家，本公司龍門計劃 GE 採購合約 64.1610 “Main Control Room Panels”及 64.1612 “Remote Shutdown Panel and Console”之廠家即為 INABENSA）；TELVENT 總公司位於西班牙 Sevilla，是一家規模宏大之企業集團，其主要事業經營範圍為 Energy(43.3%)、Traffic(30.7%)、Transport(6.8%)及 Environment(9.9%)等四大領域，主要客戶為歐洲（53.9%）、拉丁美洲（21.5%）、北美（14.2%）及中國（4.6%）等，本採購案之 Sub-supplier 廠家 INABENSA 公司亦屬其關係企業之一；經參觀 TELVENT 總公司其重心在設計部門及儀控軟體研發測試方面，該公司培養不少設計人員及測試研發人員，

實際之設備製造部份則下包給其 Sub-supplier。

- 本採購案之設備 Panel 及 Rack 機械組件安裝，如 Piping 及 Tubing 之銲接與配管、NDE 檢測、水壓試驗等均由 INABENSA 位於 Madrid 之工廠完成機械製造安裝；完成機械裝配之 Panel 及 Rack 再運到 INABENSA 位於 Sevilla 之工廠，進行儀器盤面、電氣線路及儀控卡片之安裝，所有組件完成後進行 Factory Acceptance Tests (FAT)，通過 FAT 測試再執行 Packing，並在完成最後檢驗及 QRP 審查後簽署 PQC 安排交運。目前本採購案已完成交運（簽 PQC）之設備為 Remote Sampling Cooler Panels 22 台及 Analyzer Panel 8 台（前述採購設備之項目 1 及 2 項）；剩餘之 Panel 尚有 20 台（前述採購設備之項目 3 ~ 12 項）已完成機械組裝，正進行電氣線路及儀控卡片之安裝。

- M039 採購案品質查驗方式除對製程中台電/石威選定的停留檢驗點及見證檢驗點執行檢驗，以及石威公司執行檢驗情況予以查驗外；並查驗製造廠家對其製程過程作業之品質檢驗是否落實；另查驗製造程序、作業程序書、規範、圖面，及施工方法等品質文件之正確性與適當性，並審查製程所產生之品質紀錄。

- 依據文件
 1. Specification No. 874-M0059 Revision No.3
 2. Inspection and Test Plan-Panel Structural Manufacturing, Equipment Integration in the Panels, FAT, Packing and Shipping (Document No. 04360MS039.4-08001 Rev.4)
 3. Quality Records List (Document No. 04360MS039.8-0005)

Rev.1)

4. Hydrostatic & Test Procedure (MS-7276 Rev. 1)
5. Equipment Layout Drawing- Sampling Conditioning Rack of Turbine Sampling System (Document No. 04360MS039.5-12004 Rev.4 & -22004 Rev.0)
6. Equipment Layout Drawing- Sampling Conditioning Rack of Condensate Polishing Sampling System (Document No. 04360MS039.5-12104 Rev.5 & -22104 Rev.0)
7. Equipment Layout Drawing- Sampling Conditioning Rack of Auxiliary Boiler Sampling System (Document No. 04360MS039.5-12204 Rev.4 & -22204 Rev.0)
8. Equipment Layout Drawing- Sampling Conditioning Rack of Condenser Sampling System (Document No. 04360MS039.5-12304 Rev.3 & -22304 Rev.0)
9. Equipment Layout Drawing- Chiller Equipment Panel of Turbine Sampling System (Document No. 04360MS039.5-12009 Rev.3 & -22009 Rev.0)
10. Equipment Layout Drawing- Chiller Equipment Panel of Condensate Polishing Sampling System (Document No. 04360MS039.5-12109 Rev.3 & -22109 Rev.0)

➤ TELVENT 公司查驗接洽人員：

Mr. Jaime Gordillo Garcia (Project Manager, Energy Division)

Mr. Manuel Antonio Hernandez Diaz (Generation Department
Manager, Energy Division)

Mr. Fernondo Cancela (Quality Assurance Engineer)

Miss Rocio Munez (Quality Control Engineer)

Miss Raquel Vilchez (Quality Control Engineer)

Mr. Salvador Myro Borrero (Technician, Division Fabrication
Taller Sevilla, Inabensa 公司)

2. 查驗結果

- 赴 TELVENT 總公司查驗品質文件送審及 NCR、NUC 之狀況，發現 NUC 除 NUC No.10359 廠家尚未完成改正行動無法結案

外其他已結案，NUC No.10359 之缺失為：部份 Equipment Layout Drawing 及 P & ID 等圖面 TPC/S&W 尚未審核通過（NUC No.10359 詳附件四）；經查 P & ID 部份之圖面廠家已送審完成 TPC/S&W Review Status “1”；而 Equipment Layout Drawing 之圖面送審則尚未完成 Review Status “1”，其原因為原 Equipment Layout Drawing 已完成審核，但又因 S&W Engineering 修訂核四廠房之 Layout，通知廠家亦應修訂本採購案相關 Equipment Layout Drawing 之 Routing 後重新送審，目前廠家已提送 TPC/S&W Review 中；另部份二號機之圖面廠家認為與一號機圖面 Identical，故疏忽未送審二號機之圖面。

因下次 Surveillance Activities 為執行 FAT、Packing & Shipping、QRP 審查及簽 PQC，係本合約之最後查驗，故要求廠家應儘速完成相關圖面之 Review Status “1”後，據以結案 NUC No.10359，以免最終檢驗時無法簽 PQC 影響設備之交運。

廠家 NCR 情況經查除編號:IRP/A41/4160/2005/ 035（本 NCR 係由 NUC No.10359 轉成廠家 NCR 控管）尚未結案外其他已結案，故廠家完成 NUC No.10359 改正行動後本 NCR 即可結案。【廠家 IRP LIST（NCR log）詳附件五】

- 審查 Sampling Conditioning Rack of TSS(CPSS、ABSS、CSS)，Chiller Equipment Panel of TSS(CPSS)及 Control & Recorder Panel of TSS(CPSS、ABSS、CSS)之 QRP，經查 Package 之品質紀錄，有關 CMTR、WPS、PQR、NDT、Inspection and Test Record、SIR、NCR 及 Drawings 等紀錄，廠家均能依據 QRL、ITP、Procedure 及圖面之要求備妥品質紀錄，紀錄亦頗完整，

未發現有重大缺失。(本採購案之 ITP 及 QRL 詳附件六)

- 經查核 TELVENT 公司品質文件與圖面之審核，發現其 Index List of Technical Documents/Drawings 之控管 Log 作業頗完善，Log 內對 Document title、Project Document No.、Rev. No.、Status、Planned/Due Date、Action、TPC Reply letter/Date 及 Telvent Submit Letter/Date 等管制資訊，均有詳細簡潔之記載追蹤值得參考（詳附件七）。
- 赴 INABENSA 位於 Sevilla 之工廠檢驗 Panel 及 Rack 製造安裝情況，目前 INABENSA 工作人員正進行 Panel 及 Rack 電氣 Junction Box 之電氣線路安裝，工作人員依據相關 Panel 及 Rack 之 Internal and External wiring、Wiring-Conduits Lists、PLC Internal Wiring/List 等配線圖面逐條進行安裝，各項配件安裝完並標示相對編號以資識別，符合相關作業之要求。
- 經現場查視 Panel 及 Rack 之儀器設備為 ABB 公司產品，其相關 Piping 及 Tubing 之安裝情況頗良好，銲接面亦頗整潔，看起來手工非常細緻；Panel 及 Rack 盤面及內部各式組件之 Tag Number，均依據合約規範之要求做適當的標示或以不銹鋼掛牌標示。目前大部份 Panel 及 Rack 之電氣線路已安裝完工，只剩 Unit 1 之 Sampling Conditioning Rack of Condensate Polishing Sampling System (Tag No. : 1G62-SPL-5004A) 正在進行配線，另 Unit 2 (Tag No. : 2G62-SPL-5004A) 部份則尚未安裝，其餘已完成全部組裝配線；預計下個月進行 Factory Acceptance Test (FAT)，FAT 測試通過後即可執行 Release for Shipment 簽 PQC，完成本採購案設備交運。

- 經查石威公司以往執行 MS039 採購案之 Hydrostatic Test、FAT、Packing Inspection、Final Record Review、Release for Shipment & PQC Sign-off 等相關作業，發現石威 Inspector 在執行檢驗點驗證及紀錄審查時，均在品質紀錄上留下 Stamped 以示符合採購規範之要求。

- 綜觀 MS039 「Balance of Plant Liquid Sampling & Analysis System Equipment」採購案無重大設計變更案，製程中亦無較大缺失，廠家 TELVENT 公司之溝通配合度亦相當好，目前最後一批設備（20 台 Panel）待執行通過 FAT 測試後即可 Packing，QRP 審查簽 PQC 完成交運。廠家 TELVENT 鑑於最後一批設備之 Surveillance Activities，與前批次設備執行 FAT 測試及 Shipping Releases 簽 PQC 之查驗作業相似，故廠家希望 TPC/S&W 能派較熟悉其作業之同一位 Inspector Mr. C. H. Lee 前往檢驗，經考量本採購設備之特殊性、Mr. C. H. Lee 儀電背景及其前次作業報告，予以同意儘量配合，回國後已向長官報告及電告 S&W 廠家之需求。

- 有關 MS039 採購案 Panel 及 Rack 電氣 Junction Box 之線路安裝現場作業情況之照片詳附件八。

肆、出國期間所遭遇之困難與特殊事項

無。

伍、心得與建議

綜合本次廠家製程中品質查驗之經驗，心得如下：

1. MS040 「Reactor Building Cranes and Auxiliary Fuel Building Crane」採購案，廠家德國 NKM Noell Special Cranes GmbH 爲一非常專業之 Crane 製造廠家，雖其製造部份下包給捷克之 KPS 公司，但在製造 Crane 各階段之檢驗，其 Quality Control Manager (Mr. Peter Wolf)均參與頗深並表現高度熱誠，對本公司採購設備及本公司赴廠檢驗均甚表重視與親切；有關本採購之設備，廠家提議同意將設備儲存於德國以減低長期儲存於工地之風險，對本公司減輕倉儲空間壓力及設備損傷銹蝕有很大之幫助。
2. MS039 「Balance of Plant Liquid Sampling & Analysis System Equipment」採購案，廠家西班牙 TELVENT 公司及其下包 INABENSA 公司，在 Panel 專業製造上無論在設計及研發方面都有非常先進之技術，與以往認知西班牙科技不是很進步之觀念有很大的改觀，此次感覺西班牙不只有輝煌的歷史，在科技及工業方面也很進步，很值得我們學習。
3. 整體而言本公司委託石威公司執行 Surveillance 之檢驗，依其作業留在品質紀錄之 Stamped 顯示，大致均能完成本公司之要求；惟石威公司派遣之 Inspector 在執行檢驗時，應考量某些國家生活作息習性之不同，予以配合製造廠家之工作與休息時程，不應另以超時工作視之。

陸、附件

Special Storage Requirements

1. Scope

This Special Storage Instructions is related to assembled trolleys, bottoms blocks and machinery equipment to be fabricated at European subcontractor KPS. It is not related to machinery equipment which must be installed on the Crane Bridges at the workshop of the local subcontractor in Taiwan.

The trolleys may be partly disassembled after workshop test by transport size.

This Special Storage Instructions is valid for the intermediate storage between completion of manufacturing and shipment to Lungmen jobsite.

2. Preparation for storage

The steel structure and the components are mainly protected by painting according to the painting specifications. Machined parts which require to be not painted (like brake discs) to be protected by Tectyl.

The trolley drive gear boxes and the gearboxes of auxiliary hoists and hatch hoist to be completely filled with oil for corrosion protection inside the gear boxes. The corrosion protection inside the main hoist will be renewed by the supplier after the workshop test.

3. Packing in workshop before transportation

The wheel girders of the RBC trolleys to be dismantled from the trolley frame because of the size. The main trolley part of RBC Unit 1 and Unit 2 as well as for the complete AFBC trolley to be protected by tarpaulins during transport.

All other components the will get a seaworthy packing and will be packed into 20ft shipping containers. The packed items will get a dry compound and indicator. The number of Containers will be 9 with following content:

- No. 1: RBC Unit 1 – Trolley attachments
- No. 2: RBC Unit 1 – Bottom Blocks
- No. 3: RBC Unit 2 – Trolley attachments
- No. 4: RBC Unit 2 – Bottom Blocks
- No. 5: AFBC – Bottom Blocks
- No. 6: RB Unit 1 Hatch Hoist Room 420
- No. 7: RB Unit 1 Hatch Hoist Room 430
- No. 8: RB Unit 2 Hatch Hoist Room 420
- No. 9: RB Unit 2 Hatch Hoist Room 430

4. Kind of storage

Trolleys for RBC Unit 1 and 2 and AFBC to be stored indoor protected by tarpaulins during storage period to keep the equipment free from dust and dirt.

Equipment delivered and packed in 20ft Containers will remain inside the Containers and can be stored outside.

5. Inspection of stored equipment

The stored equipment shall be inspected as follows:

Every 3 month: - Check of condition and completeness of the equipment

Every 6 month and before transportation to place of shipment:

- Check of indicator of packed equipment stored inside the containers
- Check of corrosion protection inside the Main Hoist gear boxes of RBC Unit1 and 2 and AFB trolleys

The inspection shall be certified by a Maintenance Report and witnessed by Photos. TPC will be informed 2 weeks in advance of planed delivery to place of shipment.

Any reported loss or damage of the equipment shall release immediately maintenance activities to get back the original conditions.

6. Maintenance before delivery to place of shipment

The corrosion protection inside the Main Hoist gear boxes of RBC Unit1 and 2 and AFB trolleys to be renewed by the supplier before delivery to the place of shipment.

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| NKM NOELL NKM Noell Special Cranes GmbH & Co KG | <h1>Inspection Report</h1> | No.: 06-020007-..... |
| | | Page of |

Storage Inspection

according to Special Storage Requirements,
Document No. 27015.MS040.06-020007

Additional check of indicator and corrosion protection inside main hoist gear boxes every 6 month: Yes No

| Component : | Inspection result |
|---|-------------------|
| Trolley of RBC Unit 1 | |
| Trolley of RBC Unit 2 | |
| Trolley of AFBC | |
| Container No. 1 RBC Unit 1 – Trolley attachments | |
| Container No. 2: RBC Unit 1 – Bottom Blocks | |
| Container No. 3: RBC Unit 2 – Trolley attachments | |
| Container No. 4: RBC Unit 2 – Bottom Blocks | |
| Container No. 5: AFBC – Bottom Blocks | |
| Container No. 6: RB Unit 1 Hatch Hoist Room 420 | |
| Container No. 7: RB Unit 1 Hatch Hoist Room 430 | |
| Container No. 8: RB Unit 2 Hatch Hoist Room 420 | |
| Container No. 9: RB Unit 2 Hatch Hoist Room 430 | |

Inspection remarks: _____

Maintenance activities required: No : Yes

Attachements: -
 -
 -

| | |
|--------------------------------------|---|
| Inspector Date, Signature | Client resp. Third Party Inspector Date, Signature |
|--------------------------------------|---|

Commented Extract:**3. Preservation, packing, transport, storage****3.1 Preservation**

The inside and outside housing surfaces of the units have a coating of hydro-primer approximately 60 μm thick. The outer surfaces of the units also have a top coat of synthetic resin, RAL 7034, approximately 50 μm thick. Other coatings, both inside and/or outside are possible if the customer wishes. The shaft ends, hollow shaft bores and other bright functional surfaces are wrapped with a special paper e.g. "Branorost PV7", protecting against corrosion.

→ RAL 2003

Standard preservation

Before delivery, the transmission units have successfully completed a test run, performed with an anticorrosion lubrication oil C conforming to DIN 51517. This oil is drained off following the test run and the gears are cleaned with rinsing oil AN conforming to DIN 51501. The inner components of gearboxes lubricated by mineral oil, are sprayed with a preservative agent, for example "RENOLIN MR 30".

~~Gears running with polycyclool based synthetic oils, are preserved internally with, for example, "ANTIGORIT 95".~~

→ N/A

Subsequently, all the gear's openings are closed. This treatment ensures a preservation till 18 months. If the gears are used for a machine trial before being put to their ultimate use, they must afterwards be preserved again at new. We recommend to use for the inner preservation an electric spray gun. During spraying, turn the shafts of the gears slowly by hand.

Long-time preservation

The preservation has to be checked after each period of 18 months. For that purpose, open the packing. After removing the inspection cover, check if there are not rusty parts. If there are no traces of rust, repeat the preservation treatment as described above. If corrosion traces shall be found, check back with the gearbox manufacturer, Messrs. PIV, to agree about the way to restore the gear's readiness for working. Subsequently, take the preservation measures as agreed upon with the producer, remaking the packing and the storage

| | | |
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| NKM NOELL NKM Noell Special Cranes GmbH & Co KG | <h1>Inspection Report</h1> | No.: 06-020007-0 |
| | | Page 1 of 1 |

Storage Inspection

according to Special Storage Requirements,
Document No. 27015.MS040.06-020007

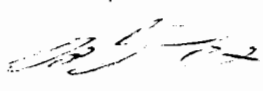
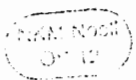
Additional check of indicator and corrosion protection inside main hoist gear boxes every 6 month: Yes No

| Component : | Inspection result |
|---|-------------------|
| Trolley of RBC Unit 1 | without objection |
| Trolley of RBC Unit 2 | without objection |
| Trolley of AFBC | without objection |
| Container No. 1 RBC Unit 1 – Trolley attachments | without objection |
| Container No. 2: RBC Unit 1 – Bottom Blocks | without objection |
| Container No. 3: RBC Unit 2 – Trolley attachments | without objection |
| Container No. 4: RBC Unit 2 – Bottom Blocks | without objection |
| Container No. 5: AFBC – Bottom Blocks | without objection |
| Container No. 6: RB Unit 1 Hatch Hoist Room 420 | without objection |
| Container No. 7: RB Unit 1 Hatch Hoist Room 430 | without objection |
| Container No. 8: RB Unit 2 Hatch Hoist Room 420 | without objection |
| Container No. 9: RB Unit 2 Hatch Hoist Room 430 | without objection |

Inspection remarks: _____

Maintenance activities required: No Yes

Attachments: -----

| | |
|---|--|
| <p style="text-align: center;">Inspector</p> <div style="text-align: center;">  30.03.2005, Wolf Peter Date, Signature </div> <div style="text-align: center; margin-top: 10px;">  </div> | <p style="text-align: center;">Client resp. Third Party Inspector</p> <p style="text-align: center; margin-top: 50px;">Date, Signature</p> |
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| | | |
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| NKM NOELL NKM Noell Special Cranes GmbH & Co KG | <h1>Inspection Report</h1> | No.: 06-020007-1 |
| | | Page 1 of 2 |

Storage Inspection

according to Special Storage Requirements,
Document No. 27015.MS040.06-020007

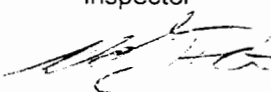
Additional check of indicator and corrosion protection inside main hoist gear boxes every 6 month: Yes No

| Component : | Inspection result |
|---|-------------------|
| Trolley of RBC Unit 1 | without objection |
| Trolley of RBC Unit 2 | without objection |
| Trolley of AFBC | without objection |
| Container No. 1 RBC Unit 1 – Trolley attachments | without objection |
| Container No. 2: RBC Unit 1 – Bottom Blocks | without objection |
| Container No. 3: RBC Unit 2 – Trolley attachments | without objection |
| Container No. 4: RBC Unit 2 – Bottom Blocks | without objection |
| Container No. 5: AFBC – Bottom Blocks | without objection |
| Container No. 6: RB Unit 1 Hatch Hoist Room 420 | without objection |
| Container No. 7: RB Unit 1 Hatch Hoist Room 430 | without objection |
| Container No. 8: RB Unit 2 Hatch Hoist Room 420 | without objection |
| Container No. 9: RB Unit 2 Hatch Hoist Room 430 | without objection |

Inspection remarks: _____

Maintenance activities required: No Yes

Attachments: Corrosion protection report inside main gear boxes

| | |
|--|---|
| <p style="text-align: center;">Inspector</p>  <p style="text-align: center;">09.06.2005, Wolf Peter Date, Signature</p> <div style="text-align: center; border: 1px solid black; border-radius: 50%; padding: 5px; width: fit-content; margin: 0 auto;"> NKM Noell GS 12 </div> | <p style="text-align: center;">Client resp. Third Party Inspector</p> <p style="text-align: center;">Date, Signature</p> |
|--|---|

| | | |
|--|----------------------------|------------------|
| NKM NOELL NKM Noell Special Cranes GmbH & Co KG | <h1>Inspection Report</h1> | No.: 06-020007-2 |
| | | Page 1 of 1 |

Storage Inspection

according to Special Storage Requirements,
 Document No. 27015.MS040.06-020007

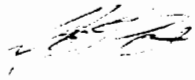
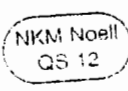
Additional check of indicator and corrosion protection inside main hoist gear boxes every 6 month: Yes No

| Component : | Inspection result |
|---|-------------------|
| Trolley of RBC Unit 1 | without objection |
| Trolley of RBC Unit 2 | without objection |
| Trolley of AFBC | without objection |
| Container No. 1 RBC Unit 1 – Trolley attachments | without objection |
| Container No. 2: RBC Unit 1 – Bottom Blocks | without objection |
| Container No. 3: RBC Unit 2 – Trolley attachments | without objection |
| Container No. 4: RBC Unit 2 – Bottom Blocks | without objection |
| Container No. 5: AFBC – Bottom Blocks | without objection |
| Container No. 6: RB Unit 1 Hatch Hoist Room 420 | without objection |
| Container No. 7: RB Unit 1 Hatch Hoist Room 430 | without objection |
| Container No. 8: RB Unit 2 Hatch Hoist Room 420 | without objection |
| Container No. 9: RB Unit 2 Hatch Hoist Room 430 | without objection |

Inspection remarks: _____

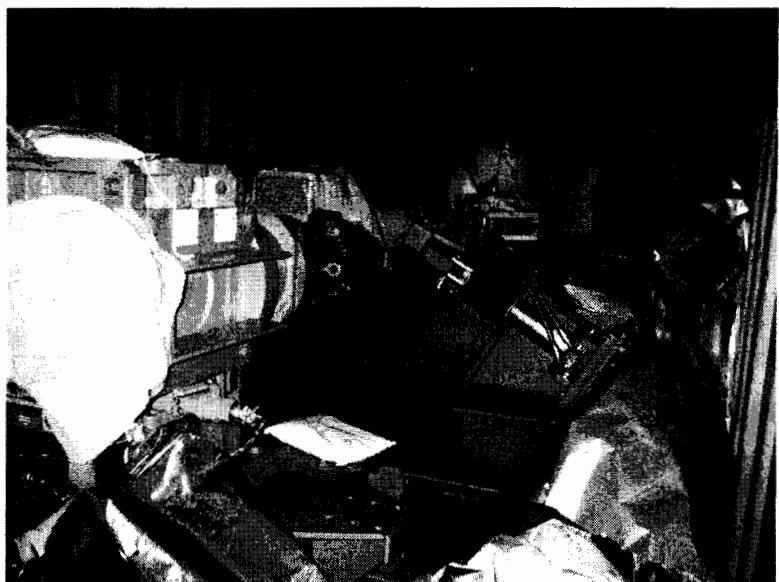
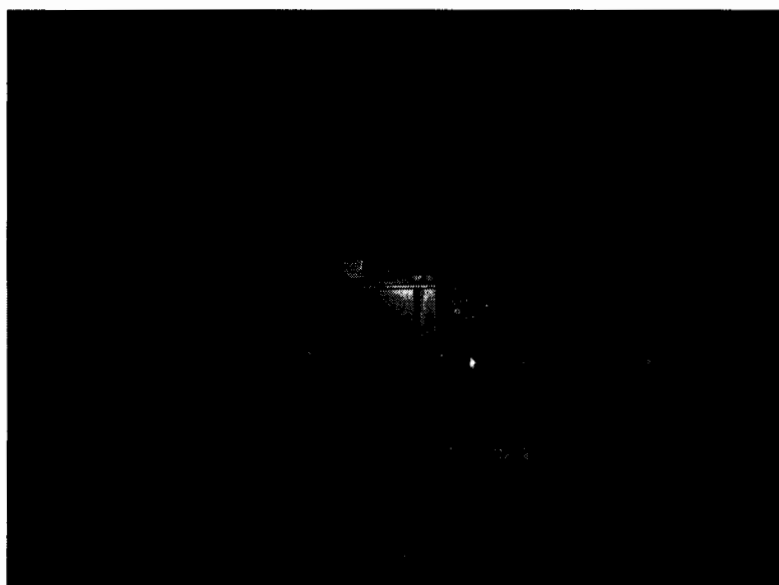
Maintenance activities required: No Yes

Attachements: -

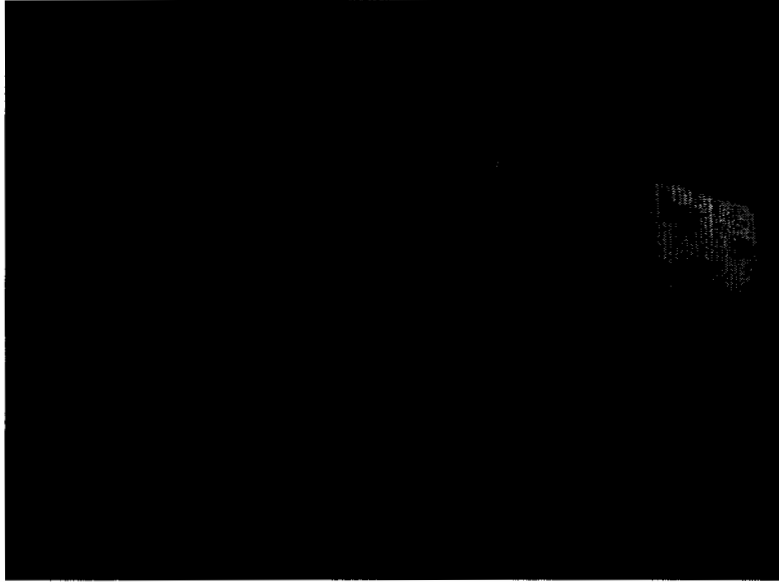
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| <p style="text-align: center;">Inspector</p> <div style="text-align: center;">  10.10.2005. Wolf Peter Date, Signature </div> <div style="text-align: center; margin-top: 10px;">  </div> | <p style="text-align: center;">Client resp. Third Party Inspector</p> <p style="text-align: center;">Date, Signature</p> |
|---|---|


BERICHT

| | | | |
|--|---|------------|--|
| Kind of machine: | Craue | | |
| Art der Arbeitsmaschine: | Kran-Anlage | | |
| Service reason Anlaß des Montageinsatzes: | Konservierung der Getr. Commission protection | | |
| Schadensfall? Wenn ja, Folgen... | / | | |
| Laufstunden bzw. Laufzeit | Std/Tag, | / | |
| 1 2 3 Schichten | | | |
| Naßbetrieb: <input type="checkbox"/> | | | |
| Stoßlastbetrieb: <input type="checkbox"/> | | | |
| häufiges Anfahren: <input type="checkbox"/> | Anlage I + FBC | | |
| Motordaten: | Gear box Typ | Serial No. | |
| Drehstrom: <input type="checkbox"/> | Getr. PE56-RM-V12-1058 | Nr. 680986 | |
| Gleichstrom: <input type="checkbox"/> | -11- | Nr. 680987 | |
| Verbrennungsmotor: <input type="checkbox"/> | Konserviert protection renewed | | |
| Gasturbine: <input type="checkbox"/> | Getr. PE28-RM-V13-160 | Nr. 680998 | |
| Leistung: kW | ist mit Oel gefüllt / voll filled with oil | | |
| Spannung: V | | | |
| Frequenzrichterbetrieb: <input type="checkbox"/> | Anlage II RBC 1 | | |
| Getriebetemperatur: | | | |
| Raumtemperatur: min. max. | | | |
| Temperatur: min. max. | Getr. PE56-RM-V22-560 | Nr. 680977 | |
| | PE56-RM-V21-560 | Nr. 680974 | |
| Kühlung: Lüfter: <input type="checkbox"/> | Konserviert | | |
| Öl-Luft-Kühler: <input type="checkbox"/> | Getr. NE-RM-V13-180 | Nr. 680985 | |
| Öl-Wasser-Kühler: <input type="checkbox"/> | PE25-T61-V11-180 | Nr. 680987 | |
| Zentrale Kühlanlage: <input type="checkbox"/> | sind mit Oel gefüllt / voll | | |
| Ölsorte: | | | |
| Ölzustand: | | | |
| Schwebstoffe: | Anlage III RBC 2 | | |
| sonstiges: | | | |
| Überwachung der Schmierstoffversorgung: | | | |
| Durchflusswächter: <input type="checkbox"/> | Getr. PE56-RM-V22-560 | Nr. 680976 | |
| Niveauschalter: <input type="checkbox"/> | Getr. PE56-RM-V21-560 | Nr. 680975 | |
| Temperaturmessung: <input type="checkbox"/> | Konserviert | | |
| | Getr. NE25-RM-V13-180 | Nr. 680984 | |
| Beschränkungen für Montage: Einbau: <input type="checkbox"/> | Getr. PE25-T61-V11-180 | Nr. 680988 | |
| Raum: <input type="checkbox"/> | sind mit Oel gefüllt / voll | | |
| Gewicht: <input type="checkbox"/> | | | |
| Transport: <input type="checkbox"/> | | | |
| Schmutz: <input type="checkbox"/> Staub: <input type="checkbox"/> Fremdkörper: <input type="checkbox"/> | | | |
| Spritzwasser: <input type="checkbox"/> Wasserdampf: <input type="checkbox"/> | | | |
| Getriebeunterbau: Einbau des Getriebes in der Anlage bitte skizzieren! | 09/06/05 [Signature] | | |
| Stahlgelüst: <input type="checkbox"/> Beton: <input type="checkbox"/> starr: <input type="checkbox"/> getrennt (gemeinsam mit An- od. Abtrieb): <input type="checkbox"/> | | | |
| Hinweise auf Bedarf an neuen Getrieben | | | |
| Hinweise für die Qualitätssicherung: <input type="checkbox"/> , Vorschlag: | | | |







| | | | | | |
|--|--|--|--|---------------------|-------|
|  NOTICE OF UNSATISFACTORY CONDITION Stone & Webster | | TPC RFA NUMBER: 10359 NUC No. : 10359 | | | |
| | | Report No. | | | |
| CLIENT: TAIWAN POWER COMPANY | | P. O. NUMBER : MS-039 | | | |
| PROJECT: LUNG MEN NUCLEAR POWER PROJECT | | Item No : Unit 1&2 BOP Liquid Sampling and Analysis System | | | |
| LOCATION: | | | | | |
| VENDOR: TELVENT / INABENSA | | VENDOR LOCATION: Madrid, Spain | | | |
| UNSATISFACTORY CONDITION: (Described In Detail) The Hydrostatic Tests of Unit 1&2 Sampling Conditioning Rack of TSS, CPSS, ABSS, CSS and Unit 1&2 Chiller Equipment Panel of TSS, CPSS were carried out in accordance with the following drawings and the test results are acceptable. However, the drawings have not yet been approved by TPC/S&W: (1) Equipment Lay Out Drawing – Sampling Conditioning Rack of TSS (No. 04306.MS039.5-12004 Rev. 4, -22004 Rev. 0) (2) Equipment Lay Out Drawing – Sampling Conditioning Rack of CPSS (No. 04306.MS039.5-12104 Rev. 5, -22104 Rev. 0) (3) Equipment Lay Out Drawing – Sampling Conditioning Rack of ABSS (No. 04306.MS039.5-12204 Rev. 4, -22204 Rev. 0) (4) Equipment Lay Out Drawing – Sampling Conditioning Rack of CSS (No. 04306.MS039.5-12304 Rev. 3, -22304 Rev. 0) (5) Equipment and Dimension Lay Out Drawing – Chiller Equipment Panel of TSS (No. 04306.MS039.5-12009 Rev. 3, -22009 Rev. 0) (6) Equipment and Dimension Lay Out Drawing – Chiller Equipment Panel of CPSS (No. 04306.MS039.5-12109 Rev. 3, -22109 Rev. 0) (7) P&ID- Sampling Conditioning Rack of TSS (No. 04306-1G62-M2118, -M2119 Rev. 4) (8) P&ID- Sampling Conditioning Rack of CPSS (No. 04306-1G62-M2120, -M2121 Rev. 6) (9) P&ID- Sampling Conditioning Rack of ABSS (No. 04306-1G62-M2122 Rev. 5) (10) P&ID- Sampling Conditioning Rack of CSS (No. 04306-1G62-M2123 Rev. 5) In case the final approved drawings have impact on the hydrostatic test, TELVENT shall re-evaluate the test results and/or re-test. | | | | | |
| ORIGINATOR: (S&W Inspection REP.) Y. S. Chen <i>Y.S. Chen</i> | | DATE: 2005/04/26 | VENDOR RECEIPT: JAIME GORDILLO <i>[Signature]</i> | DATE: 2005/04/26 | |
| CORRECTIVE ACTION: (Completed By Vendor's Representative) | | | | | |
| VENDOR'S REPRESENTATIVE: | | DATE: | VERIFICATION: (S&W Inspection REP.) | SATISFACTORY | DATE: |
| | | | | UNSATISFACTORY | |

TELVENT

Lungmen Nuclear Units 1 & 2 Contract No. 8749111M03900

IRP List updated on May 25, 2005

| IRP Reference Number | Description | Current Status | Observations |
|-----------------------|--|----------------|--|
| IRP/A41/4106/2003/009 | The list of Quality system procedures provided by Sainco during the audit, shall be included in Quality assurance program (N° 04360.MS039.4.00001) as required by TPC's comments and be sent to TPC for Review | Closed | This IRP is related to NUC 06887-0078 item 1 / 4. Telvent sent Corrective Actions information by letter SAI-SWT-MS039-0267 dated April 16, 2004 |
| IRP/A41/4106/2003/010 | Internal audits were planned and performed for three (3) Internal Departments in November 2002. However, one (1) audit report has not been prepared, and two (2) audits report have not been approved so far, and no control measures were established for controlling the audit reports in time and related IRP | Closed | This IRP is related to NUC 06887-0078 item 4 / 4. Telvent sent Corrective Actions information by letters SAI-SWT-MS039-0267 dated April 16, 2004, SWT-MS039-0272 dated May 10, 2004 and SAI-SWT-MS039-0309 dated October 7, 2004. |
| IRP/A41/4106/2003/011 | The layout of products in the storage area should be established and all products should be stored in the specified locations as required QA Manual Sec 10. Par 10.08 | Closed | This IRP is related to NUC 06887-0078 item 3 / 4. Telvent sent Corrective Actions information by letters SAI-SWT-MS039-0267 dated April 16, 2004 and SAI-SWT-MS039-0308 dated October 7, 2004. |
| IRP/A41/4106/2003/012 | Lungmen Project Specification (n° 814-MS039 Rev 3 par. 3.4.2.1) specifies that each submitted document shall contain the applicable identification N°. However, the equipment tag N° <ID N°> is not contained in the submitted drawing 'Dimensioned outline Drawing - Remote Sampling Cooling Panel of Turbine Sampling System Unit 1 <N° 04360.M6039.5.12001 Rev 1> | Closed | This IRP is related to NUC 06887-0078 item 2 / 4. Telvent sent Corrective Actions information by letter SAI-SWT-MS039-0267 dated April 16, 2004 |
| IRP/A41/4106/2003/013 | IRP List as required in BID Spec Parag. 3.4.1.4 should be prepared and submitted to TPC monthly for review and Information | Closed | Telvent have submitted IRP Lists to TPC |

TELVENT

Lungmen Nuclear Units 1 & 2 Contract No. 8749111M03900

IRP List updated on May 25, 2005

| IRP Reference Number | Description | Current Status | Observations |
|-----------------------|--|----------------|---|
| IRP/A41/4106/2003/014 | QA Manual Sec 05 Pag 05.11 for IRPs and INC control measures should be revised to meet the current control Status | Closed | Telvent sent rev 2 of the Quality Assurance Program by letter SAI-TPC-0029 of 5/14/03, including required measures. |
| IRP/A41/4106/2003/015 | The retention Period for quality records as specified in section 06.15 should be revised (ie: the records will kept for a period of three years for the execution date) | Closed | Telvent sent rev 2 of the Quality Assurance Program by letter SAI-TPC-0029 of 5/14/03, including required information. |
| IRP/A41/4106/2004/038 | <p>During inspection on April 13, 2004, TPC's inspector issued a Notice of Unsatisfactory Condition related to following subject.</p> <p>The Procedures, Drawings, ITPs & QRL to be sent to TPC / S&W for approval, except for the items such as the following which have already been sent for approval:</p> <ul style="list-style-type: none"> • ITP for Panel Structure Manufacturing. • Document Index • Surface Treatment, Priming and Painting. • Welds Inspection for Structure Steel with Liquid Penetrant. • Hydrostatic Test Procedure. | Closed | <p>This IRP is related to NUC TPC RFA Number 5244 of April 13, 2004.</p> <p>Telvent has sent to TPC / S&W all documentation required for the Remote Sampling Cooler Panels and the Analyzer Panels and have been approved as follows:</p> <ul style="list-style-type: none"> • ITP for Panel Structure Manufacturing. ref. 04360.MS039.4-08001 rev 4 by letter SWT-SAI-MS039-0238 of 10/21/04 (review st. "1") • Document Index ref 04360.MS039.8-00005 rev 0 email by Fusen Lee of 10/19/04 (review st. "1") • Surface Treatment, Priming and Painting. Ref 04360.MS039.4-00006 rev 0 by SWT-SAI-MS039-0070 of 6/17/03 (review st. "1") • Welds Inspection for Structure Steel with Liquid Penetrant. ref 04360.MS039.4-00003 rev 1 by SWT-SAI-MS039-0179 0 03/12/2004 (review st. "1") • Hydrostatic Test Procedure. ref 04360.MS039.4-02001 rev 1 by SWT-SAI-MS039-0216 of 06/14/04 (review st. "1") <p>Closing of corresponding NUC (Notice of Unsatisfactory Condition) has been approved by TPC/S&W inspector on October 26, 2004.</p> |

TELVENT

Lungmen Nuclear Units 1 & 2 Contract No. 8749111M03900

IRP List updated on May 25, 2005

| IRP Reference Number | Description | Current Status | Observations |
|-----------------------|---|----------------|---|
| IRP/A41/4106/2004/109 | <p>During the performance of the Hydrostatic Test of the RSCS panels on September 17, 2004, TPC's inspector issued a Notice of Unsatisfactory Condition related to worn down thread of collectors 50 mm inlet/outlet cooling water.</p> <p>There were two separated hydrostatic test for the sampling & cooling water respectively. The test results were acceptable.</p> <p>However, worn down threads were found on the collectors 50 mm inlet cooling water (Drawing: 04360.M5039.5-12002 Rev. 5) for the equipment 1G62-CLR-5002C, 1G62-CLR-5002B, 1G62-CLR-5002H and 1G62-CLR-5002L.</p> <p>Also, the collectors 50 mm outlet cooling water (Drawing: 04360.M5039.5-12002 Rev. 5) for the equipment 1G62-CLR-5002D, 1G62-CLR-5002F, 1G62-CLR-5002G, 2G62-CLR-5002A and 2G62-CLR-5002D.</p> | Closed | <p>Telvent have manufactured small pieces of pipe 2' with NPT, with same material specification than the cooling water inlet and the cooling water outlet collectors of the RSCS panels. Then have cut a small piece of the collector where the wore thread is and we have welded the pieces to the collectors. Finally we have performed all the hydrostatic tests for all the collectors of all the panels, according to the procedure approved by TPC/S&W and the test result has been satisfactory for the TPC inspector. Closing of corresponding NUC (Notice of Unsatisfactory Condition) has been approved by TPC/S&W inspector on October 25, 2004.</p> |
| IRP/A41/4106/2004/120 | <p>Hydrostatic Test of Unit 1 & 2 for Liquid Sampling and Analysis System Equipment</p> <p>The relief valve with piping shall be added one pipe support for anti-vibration that the captioned support shall be added for all panels of the same type.</p> | Closed | <p>Telvent have included anti-vibration supports on the pipes of connection to the relief valves of all the RSCS panels. The anti-vibration support installation have been verified and accepted during the RSCS panels FAT inspection by the TPC/S&W inspector. Closing of corresponding NUC (Notice of Unsatisfactory Condition) has been approved by TPC/S&W inspector on October 25, 2004.</p> |
| IRP/A41/4106/2004/121 | <p>Hydrostatic Test of Unit 1 & 2 for Liquid Sampling and Analysis System Equipment.</p> <p>The collectors (50 mm diameter) of inlet / outlet for cooling water that the line inside of collectors shall be cleaned and re-checked the cleaning condition before Hydrostatic Tests.</p> | Closed | <p>Telvent have cleaned completely, by pressurized air flow, all the collectors (50 mm diameter) inlet / outlet for cooling water lines of the RSCS panels and the cleaning condition have been re-checked and accepted, by the TPC's inspector before the hydrostatic tests. Closing of corresponding NUC (Notice of Unsatisfactory Condition) has been approved by TPC/S&W inspector on October 25, 2004.</p> |

TELVENT

Lungmen Nuclear Units 1 & 2 Contract No. 8749111M03900

IRP List updated on May 25, 2005

| IRP Reference Number | Description | Current Status | Observations |
|-----------------------|--|----------------|--|
| IRP/A41/4106/2005/033 | During the performance of the Hydrostatic Test of the Sample Conditioning Rack of the Turbine Sampling System Unit 1 (panel n° 1G62-SPL-5001A), it was detected a leakage through the sample flush valve 1G62-V-5078, that is closed during the test, so the result of the test of this line (first stage) is not acceptable. | Closed | The valve 1G62-V-5078 has been dismantled from the rack, the internals have been cleaned and the valve has been mounted again in the rack. Then, the hydrostatic test of this line (first stage) has been performed again with acceptable result, approved by TPC/S&W inspector on April 25, 2005. |
| IRP/A41/4106/2005/035 | <p>During inspection on April 18-26, 2005, TPC/S&W's inspector issued a Notice of Unsatisfactory Condition (NUC No. 10359) as described following :</p> <p>The Hydrostatic Tests of Unit 1&2 Sampling Conditioning Rack of TSS, CDPSS, ABSS, CSS and Unit 1&2 Chiller Equipment Panel of TSS, CDPSS were carried out in accordance with the following drawings and the test results are acceptable. However, the drawings have not yet been approved by TPC/S&W:</p> <ol style="list-style-type: none"> (1) Equipment Lay Out Drawing – Sampling Conditioning Rack of TSS (No. 04306.MS039.5-12004 Rev. 4, -22004 Rev. 0) (2) Equipment Lay Out Drawing – Sampling Conditioning Rack of CDPSS (No. 04306.MS039.5-12104 Rev. 5, -22104 Rev. 0) (3) Equipment Lay Out Drawing – Sampling Conditioning Rack of ABSS (No. 04306.MS039.5-12204 Rev. 4, -22204 Rev. 0) (4) Equipment Lay Out Drawing – Sampling Conditioning Rack of CSS (No. 04306.MS039.5-12304 Rev. 3, -22304 Rev. 0) (5) Equipment and Dimension Lay Out Drawing – Chiller Equipment Panel of TSS (No. 04306.MS039.5-12009 Rev. 3, -22009 Rev. 0) (6) Equipment and Dimension Lay Out Drawing – Chiller Equipment Panel of CDPSS (No. 04306.MS039.5-12109 Rev. 3, -22109 Rev. 0) (7) P&ID- Sampling Conditioning Rack of TSS (No. 04306-1G62-M2118, -M2119 Rev. 4) (8) P&ID- Sampling Conditioning Rack of CDPSS (No. 04306-1G62-M2120, -M2121 Rev. 6) (9) P&ID- Sampling Conditioning Rack of ABSS (No. 04306-1G62-M2122 Rev. 5) (10) P&ID- Sampling Conditioning Rack of CSS (No. 04306-1G62-M2123 Rev. 5) <p>In case the final approved drawings have impact on the hydrostatic test,</p> | Open | <p>TPC has sent letter SWT-SAI-MS039-0253 of May 6, 2005 with comments to P&IDs No. 04306-1G62-M2118, -M2119 Rev. 4, 04306-1G62-M2120, -M2121 Rev. 6 and 04306-1G62-M2122 Rev. 5. These comments do not have impact on the hydrostatic test</p> <p>Pending that TPC/S&W provides comments / approval to the other drawings related to NUC No. 10359.</p> |

| INABENSA | | Inspection and Test Plan - Panel Structural Manufacturing | | | | | TAIWAN POWER COMPANY LUNG MEN PROJECT FOURTH POWER PLANT UNITS 1 AND 2 04360.MS039.4-08001 Rev. 2 | | | |
|---|---|--|---------------|------|--------------|--------------------------|---|--------------------|-------|--|
| Customer: Telvent | | Order No. | | Rev. | Date Issued: | Prepared by | Approved by | Drawing No. | | |
| Subject: BOP Liquid Sampling and Analysis Equipment | | Equipment: | | | | | | | | |
| Item No. | Test, Inspection or Activity to be witnessed | Specification | Interventions | | | Inspection / Test Report | Results (*) | Witness/Date | | |
| | | | R | W | H | | Inabensa | Telvent | TPC | |
| 1 | Manufacturing | | | | | | | | | |
| 1.1 | Mechanical Inspection | PE-3132/2330T003 | 1 | | | | | | | |
| 1.1.1 | General Dimensions | PE-3132/2330T003 | 1 | | | | | | | |
| 1.1.2 | Location of Holes, Supports, Stiffeners, etc. | PE-3132/2330T003 | 1 | | | | | | | |
| 1.2 | Welding Control | | | | | | | | | |
| 1.2.1 | Visual Inspection of Welds | 04360.MS039.4-00002 | 1 | 2 | | | | | | |
| 1.2.2 | Welds Inspections with Liquid Penetrant | 04360.MS039.4-00003 | 1 | 2, 3 | | | | | | |
| 2 | Painting Inspection | | | | | | | | | |
| 2.1 | Surface Treatment | 04360.MS039.4-00006 | 1 | | | | | | | |
| 2.2 | Priming | 04360.MS039.4-00006 | 1 | 2 | | | | | | |
| 2.3 | Painting | 04360.MS039.4-00006 | 1 | | 2 | | | | | |
| Codes: | | R. Inspection Report | | | (*) | | | C. Conformity | | |
| | | W. Witness Point | | | (**) | | | N. Nonconformity | | |
| | | H. Hold Point | | | | | | First Process Only | | |
| | | | | | | | Sheet No. | | 1 / 1 | |

| INABENSA | | Inspection and Test Plan- Equipment Integration in the Panels | | | | | TAIWAN POWER COMPANY LUNG MEN PROJECT - FOURTH POWER PLANT UNITS 1 AND 2 04360.MS039.4-08001 Rev. 2 NUCLEAR | | |
|---|--|--|---------------|--------|--------------|--------------------------|--|-------------|--------------|
| Customer: Telvent | | Order No. | | Rev. | Date Issued: | Prepared by | Approved by | Drawing No. | |
| Subject: BOP Liquid Sampling and Analysis Equipment | | Equipment: | | | | | | | |
| Item No. | Test, Inspection or Activity to be witnessed | Specification | Interventions | | | Inspection / Test Report | Results (*) | | Witness/Date |
| | | | R | W | H | | Inabensa | Telvent | TPC |
| 3 | Instruments, piping/tubing assembly control | | | | | | | | |
| 3.1 | Components Location Check-up | PE-31-05 | 1 | 2 | | | | | |
| 3.2 | Visual inspection of Welds | 04360.MS039.4-00004 | 1 | 2 | | | | | |
| 3.3 | NDE inspection of process piping welding | 04360.MS039.4-00005 | 1 | 2 | | | | | |
| 3.4 | Final Hydrostatic Test | 04360.MS039.4-02001 | 1 | 2 | 3 | | | | |
| 4 | Electric Assembly Control | | | | | | | | |
| 4.1 | Components Location Check-up | PE-3132/2330T007 | 1 | 2 | | | | | |
| 4.2 | Wiring Visual Check | PE-3132/2330T007 | 1 | 2 | | | | | |
| 5 | Final Electric Inspection and Testing | | | | | | | | |
| 5.1 | Final Visual and Dimensional Inspection | PE-31-05 | 1 | 2 | | | | | |
| 5.2 | Wire Continuity Check | PE-31-05 | 1 | 2 (**) | | | | | |
| 5.3 | High potential Insulation Dielectric Test | PE-31-05 | 1 | | | | | | |
| 5.4 | Operational Test | PE-31-05 | 1 | | 2 | | | | |
| Codes: | | R. Inspection Report | | | (*) | | C. Conformity | | |
| | | W. Witness Point | | | (**) | | N. Nonconformity | | |
| | | H. Hold Point | | | | | First Process Only | | |
| | | | | | | | Sheet No. | 1 / 1 | |

| TELVENT | | Inspection and Test Plan- FAT, Packing and Shipping | | | | TAIWAN POWER COMPANY LUNGMEN PROJECT FOURTH PHASE CLEAR POWER PLANT UNITS 1 AND 2 04360.MS039. 4-08001 Rev. 2 | | | | |
|---|---|--|---------------|---|--------------|--|-------------|---|-----|-----------------|
| Customer: TPC | | Order No. | | Rev. | Date Issued: | Prepared by | Approved by | Drawing No. | | |
| Subject: BOP Liquid Sampling and Analysis Equipment | | | | | | | | | | |
| Item No. | Test, Inspection or Activity to be witnessed | Specification | Interventions | | | Inspection / Test Report | Results (*) | Witness/Dat | | |
| | | | R | W | H | | | Telvent | TPC | |
| 6 | Factory Acceptance Tests | | | | | | | | | |
| 6.1 | FAT of RSCS Panels of TSS | 04360.MS039. 4-18100 | 2 | | 3 | | | | | |
| 6.2 | FAT of Analyzer Panels of TSS, CPSS, ABSS and CSS | 04360.MS039. 4-18101 | 2 | | 3 | | | | | |
| 6.3 | FAT of Sample Conditioning Panels of TSS, CPSS, ABSS and CSS and Chiller Panels of TSS and CPSS | 04360.MS039. 4-18102 | 2 | | 3 | | | | | |
| 6.4 | FAT of Control & Recorder Panels of TSS, CPSS, ABSS and CSS | 04360.MS039. 4-18103 | 2 | | 3 | | | | | |
| Codes: | | 1. Inabensa 2. Telvent 3. TPC | | R. Inspection Report W. Witness Point H. Hold Point | | (*) (**) | | C. Conformity N. Nonconformity First Process Only | | Sheet No. 1 / 1 |

| TELVENT | | Inspection and Test Plan- FAT, Packing and Shipping | | | | | TAIWAN POWER COMPANY LUNGMEN PROJECT FOURTH PHASE CLEAR POWER PLANT UNITS 1 AND 2 04360.MS039. 4-08001 Rev. 2 | | | |
|---|---|--|---------------|------|--------------|--------------------------|---|--------------------|-----|-----------------|
| Customer: TPC | | Order No. | | Rev. | Date Issued: | Prepared by | Approved by | Drawing No. | | |
| Subject: BOP Liquid Sampling and Analysis Equipment | | Equipment: | | | | | | | | |
| Item No. | Test, Inspection or Activity to be witnessed | Specification | Interventions | | | Inspection / Test Report | Results (*) | Witness/Date | | |
| | | | R | W | H | | | Telvent | TPC | |
| 7 | Packing | | | | | | | | | |
| 7.1 | Packing of RSCS Panels of TSS | 04360.MS039. 7-08002 | 2 | | 3 | | | | | |
| 7.2 | Packing of Analyzer Panels of TSS, CPSS, ABSS and CSS | 04360.MS039. 7-08002 | 2 | | 3 | | | | | |
| 7.3 | Packing of Sample Conditioning Panels of TSS, CPSS, ABSS and CSS and Chiller Panels of TSS and CPSS | 04360.MS039. 7-08002 | 2 | | 3 | | | | | |
| 7.4 | Packing of Control & Recorder Panels of TSS, CPSS, ABSS and CSS | 04360.MS039. 7-08002 | 2 | | 3 | | | | | |
| Codes: | | R. Inspection Report | | | (*) | | C. Conformity | | | Sheet No. 1 / 1 |
| | | W. Witness Point | | | (**) | | N. Nonconformity | | | |
| | | H. Hold Point | | | | | | First Process Only | | |

| TELVENT | | Inspection and Test Plan- FAT, Packing and Shipping | | | | TAIWAN POWER COMPANY LUNG MEN PROJECT FOURTH POWER PLANT UNITS 1 AND 2 04360.MS039. 4-08001 Rev. 2 | | | |
|---|--|---|------------------------|------|---|---|-------------|-----------------------------|--------------|
| | | | | | | Customer: TPC | Order No. | Rev. | Date Issued: |
| Subject: BOP Liquid Sampling and Analysis Equipment | | Equipment: | | | | PPI- | | | |
| Item No. | Test, Inspection or Activity to be witnessed | Specification | Interventions R W H | | | Inspection / Test Report | Results (*) | Witness/Date Telvent TPC | |
| 8 | QA Document Review and PQC Sign-off | | 2 | | 3 | | | | |
| 9 | Shipping Release | | | | | | | | |
| 9.1 | Shipping Release of RSCS Panels of TSS | | | | 3 | | | | |
| 9.2 | Shipping Release of Analyzer Panels of TSS, CPSS, ABSS and CSS | | | | 3 | | | | |
| 9.3 | Shipping Release of Sample Conditioning Panels of TSS, CPSS, ABSS and CSS and Chiller Panels of TSS and CPSS | | | | 3 | | | | |
| 9.4 | Shipping Release of Control & Recorder Panels of TSS, CPSS, ABSS and CSS | | | | 3 | | | | |
| Codes: | | R. Inspection Report | | (*) | | C. Conformity | | Sheet No. 1 / 1 | |
| | | W. Witness Point | | (**) | | N. Nonconformity | | | |
| | | H. Hold Point | | | | First Process Only | | | |

(Final sheet)

Quality Assurance Record List

Sheet No 1 of 1

1. Materials
 - 1.1. Conformity Certificates
 - 1.2. EMC Certifications
2. Qualification Documents
 - 2.1. Seismic Calculations
3. Welding
 - 3.1. Welder Qualification Records
 - 3.2. Welding Procedure
4. Non-Destructive Testing (NDT)
 - 4.1. Welds Inspection with Liquids Penetrant Records
 - 4.2. List of Qualified NDT Personnel
 - 4.3. Weld Inspection with Liquids Penetrant Procedure
5. Final Fabrication, Inspection and Testing Records
 - 5.1. Product Quality Certification
 - 5.2. Crimping and Stripping Tools Inspection Records
 - 5.3. Inspection and Test Records
 - 5.4. Final Inspection Records of Cleaning, Preserving, Hardware identification and Packaging
 - 5.5. Equipment Subsupplier List
6. Document Control Records
 - 6.1. Final List of all Drawings, Procedures, etc... with Revision Number
7. Deviations
 - 7.1. Supplier's Information Request (SIR)
 - 7.2. Nonconformance Reports

(Final sheet)

TELVENT

Taiwan Power Company
Lungmen Nuclear Power Project Units 1 and 2
Contract No. 8749111M03900

5. Status
1: Work can proceed
2: Revise and resubmit. Work can proceed subject to incorporation of comments
3: Revise and resubmit. Work can not proceed.
4: For information, no review required.

Doc. No. 04360.MS039. 8-08001 rev 06

Date: 10/14/2005

| Row# | Plant Unit No. | Document title | Project Document No. | Rev No | S | Planned /Due Date | Action | TPC Reply Date | TPC Reply Letter | Telvent Submit Date | Telvent Submit Letter | Remarks |
|------|----------------|---|----------------------|--------|---|-------------------|--------|----------------------|------------------------------|---------------------|-----------------------|---|
| | | INDEX | | | | | | | | | | NOTES: |
| 0 | | 1. General | | | | | | | | | | PN = planned to be issued by Telvent |
| 12 | | 2. QA Program & Surveillance | | | | | | | | | | RE = in review process by TPC |
| 50 | | 3. Test and Inspection | | | | | | | | | | Action: pending action by TPC or Telvent |
| 86 | | 4. Technical Calculations and Reports | | | | | | | | | | Planned / Due date: planned date to issue the document by Telvent or due date of comments/approval by TPC |
| 148 | | 5. Mechanical | | | | | | | | | | N/A = not applicable |
| 367 | | 6. Electrical | | | | | | | | | | |
| 468 | | 7. Instrumentation and Control | | | | | | | | | | |
| 602 | | 8. Arrangement and Interface | | | | | | | | | | |
| 635 | | 9. P&IDs | | | | | | | | | | |
| 706 | | 10. Equipment Lists and Data Sheets | | | | | | | | | | |
| 807 | | 11. Transportation, Storage and Installation | | | | | | | | | | |
| 815 | | 12. Operation and Maintenance | | | | | | | | | | |
| 839 | | 13. Manufacturer's Instructions and Technical Information | | | | | | | | | | |
| 0 | | 1. General | | | | | | | | | | |
| 1 | Unit 1/2 | Index List of Technical Documents / Drawings Unit 1 and Unit 2 | 04360.MS039. 8-08001 | 0 | 2 | | | 11/04/02 | SWT-SAI-0015 | 10/23/02 | SAI-SWT-0004 | |
| 2 | | | 04360.MS039. 8-08001 | 1 | 4 | | | | | 01/17/03 | email | |
| 3 | | | 04360.MS039. 8-08001 | 2 | 4 | | | | | 04/04/03 | email | |
| 4 | | | 04360.MS039. 8-08001 | 3 | 4 | | | | | 12/10/04 | SAI-SWT-0328 | |
| 5 | | | 04360.MS039. 8-08001 | 4 | 4 | | | | | | | The rev 4 (Summary) has been sent to TPC&S&W attached in document 04360.MS039. 7-08600 rev 0 |
| 6 | | | | | | | | | | | | |
| 7 | Unit 1/2 | Project Schedule | 04360.MS039. 8-08002 | 0 | 2 | | | 11/25/02 | SWT-SAI-0019 | 11/06/02 | SAI-SWT-0007 | |
| 8 | | | 04360.MS039. 8-08002 | 1 | 1 | | | 01/02/03 | SWT-SAI-0023 | 11/28/02 | SAI-SWT-0010 | |
| 9 | | | | | | | | | | | | |
| 10 | Unit 1/2 | Final List of Documents for Remote Sampling Cooler Panels and Analyzer Panels for Units 1 and 2 | 04360.MS039. 8-08010 | 0 | 4 | | | | | | | Included in QA Record Package of First Delivery of panels |
| 11 | | | | | | | | | | | | |
| 12 | | 2. QA Program & Surveillance | | | | | | | | | | |
| 13 | Unit 1/2 | Quality Assurance Program | 04360.MS039. 4-00001 | 0 | 2 | | | 11/12/02 11/20/02 | SWT-SAI-0016 SWT-SAI-0018 | 09/20/02 | SAI-TPC-0008 | |
| 14 | | | 04360.MS039. 4-00001 | 1 | 1 | | | 02/26/03 | SWT-SAI-0029 | 02/04/03 | SAI-TPC-0025 | |

| Taiwan Power Company Lungmen Nuclear Power Project Units 1 and 2 Contract No. 8749111M03900 Date : 10/14/2005 Doc. No. 04360.MS039. 8-08001 rev 06 | | | | | | | | | | | | |
|--|----------------|--|----------------------|--------|----|--------------------|---------|----------------|------------------|---------------------|-----------------------|--|
| Row# | Plant Unit No. | Document title | Project Document No. | Rev No | S | Planned / Due Date | Action | TPC Reply Date | TPC Reply Letter | Telvent Submit Date | Telvent Submit Letter | Remarks |
| 168 | | | | | | | | | | | | |
| 169 | Unit 1/2 | Manufacturing Details - Remote Sampling Cooling Panels of Turbine Sampling System Unit 1 | 04360.MS039. 5-12602 | 0 | 4 | | | | | | | |
| 170 | | | | | | | | | | | | |
| 171 | Unit 1 | Dimensioned Outline Drawing - Sample Conditioning Rack of Turbine Sampling System Unit 1 | 04360.MS039. 5-12003 | 0 | 2 | | | 01/30/03 | SWT-SAI-0026 | 01/15/03 | SAI-SWT-0012 | |
| 172 | | | | | | | | 05/21/03 | SWT-SAI-0054 | 04/10/03 | SAI-SWT-0033 | |
| 173 | | | | | | | | 10/28/03 | SWT-SAI-0129 | 08/01/03 | SAI-SWT-0132 | |
| 174 | | | | | | | | 02/10/04 | SWT-SAI-0157 | 11/26/03 | SAI-SWT-0193 | |
| 175 | | | | | | | | 04/27/04 | SWT-SAI-0207 | 03/23/04 | SAI-SWT-0247 | |
| 176 | | | | | | | | | | | | |
| 177 | | | | | | | | | | | | |
| 178 | Unit 2 | Dimensioned Outline Drawing - Sample Conditioning Rack of Turbine Sampling System Unit 2 | 04360.MS039. 5-22003 | 0 | 4 | | | | | 25/2/05 | SAI-SWT-0337 | |
| 179 | | | | | | | | | | | | |
| 180 | Unit 1 | Equipment Layout Drawing - Sample Conditioning Rack of Turbine Sampling System Unit 1 | 04360.MS039. 5-12004 | 0 | 2 | | | 06/19/03 | SWT-SAI-0072 | 05/15/03 | SAI-SWT-0058 | |
| 181 | | | | | | | | 10/29/03 | SWT-SAI-0130 | 08/08/03 | SAI-SWT-0141 | Telvent sent letter SAI-SWT-0155 Of 9/11/03. |
| 182 | | | | | | | | 10/02/04 | SWT-SAI-0157 | 11/26/03 | SAI-SWT-0193 | |
| 183 | | | | | | | | 04/27/04 | SWT-SAI-0207 | 03/23/04 | SAI-SWT-0247 | |
| 184 | | | | | | | | 06/01/05 | SWT-SAI-0255 | 04/14/05 | SAI-SWT-0345 | |
| 184 | | | | | | | | 09/06/05 | SWT-SAI-0270 | 08/04/05 | SAI-SWT-0364 | |
| | | | | | | | | 10/14/05 | SWT-SAI-0271 | 09/12/05 | SAI-SWT-0365 | |
| 184 | | | | | | | | | | 10/20/05 | SAI-SWT-0369 | |
| 185 | | | | | | | | | | | | |
| 186 | Unit 2 | Equipment Layout Drawing - Sample Conditioning Rack of Turbine Sampling System Unit 2 | 04360.MS039. 5-22004 | 0 | PN | 05/30/05 | Telvent | | | | | |
| 187 | | | | | | | | | | | | |
| 188 | Unit 1 | Dimensioned Outline Drawing - Control & Recorder Panel of Turbine Sampling System Unit 1 | 04360.MS039. 5-12007 | 0 | 2 | | | 03/20/03 | SWT-SAI-0036 | 01/27/03 | SAI-SWT-0014 | |
| 189 | | | | | | | | 05/19/03 | SWT-SAI-0053 | 04/23/03 | SAI-SWT-0037 | |
| 190 | | | | | | | | 10/08/03 | SWT-SAI-0122 | 07/31/03 | SAI-SWT-0129 | Telvent sent letter SAI-SWT-0155 Of 9/11/03 |
| 191 | | | | | | | | 04/27/04 | SWT-SAI-0207 | 02/25/04 | SAI-SWT-0242 | |
| 192 | | | | | | | | | | | | |
| 193 | Unit 2 | Dimensioned Outline Drawing - Control & Recorder Panel of Turbine Sampling System Unit 2 | 04360.MS039. 5-22007 | 0 | 4 | | | | | 25/2/05 | SAI-SWT-0337 | |
| 194 | | | | | | | | | | | | |
| 195 | Unit 1 | Equipment Layout Drawing - Control & Recorder Panel of Turbine Sampling System Unit 1 | 04360.MS039. 5-12008 | 0 | 2 | | | 10/08/03 | SWT-SAI-0122 | 07/31/03 | SAI-SWT-0129 | Telvent sent letter SAI-SWT-0155 Of 9/11/03 |

TELVENT

Taiwan Power Company
Lungmen Nuclear Power Project Units 1 and 2
Contract No. 8749111M03900

S: Status
1: Work can proceed
2: Revise and resubmit. Work can proceed subject to incorporation of comments
3: Revise and resubmit. Work can not proceed
4: For information, no review required.

| Row# | Plant Unit No. | Document title | Project Document No. | Rev No | S | Planned / Due Date | Action | TPC Reply Date | TPC Reply Letter | Telvent Submit Date | Telvent Submit Letter | Remarks |
|---|----------------|---|----------------------|--------|----|--------------------|---------|----------------|------------------|---------------------|-----------------------|---|
| Index List of Technical Documents / Drawings | | | | | | | | | | | | |
| Date : 10/14/2005 Doc. No 04360.MS039. 8-08001 rev 06 | | | | | | | | | | | | |
| 689 | Unit 1/2 | P & ID - Sample Conditioning Rack of Condenser Sampling System Unit 1 | 04360-1G62-M2123 | 0 | 2 | | | 12/11/02 | SWT-SAI-0021 | 11/04/02 | SAI-SWT-0006 | |
| 690 | | | 04360-1G62-M2123 | 1 | 2 | | | 03/11/03 | SWT-SAI-0033 | 02/24/03 | SAI-SWT-0020 | |
| 691 | | | 04360-1G62-M2123 | 2 | 2 | | | 08/21/03 | SWT-SAI-0091 | 06/26/03 | SAI-SWT-0087 | Telvent sent letter SAI-SWT-0142 on 08/11/03. |
| 692 | | | 04360-1G62-M2123 | 3 | 2 | | | 02/05/04 | SWT-SAI-0156 | 09/15/03 | SAI-SWT-0158 | |
| 693 | | | 04360-1G62-M2123 | 4 | 2 | | | 12/13/04 | SWT-SAI-0243 | 02/17/04 | SAI-SWT-0237 | |
| 694 | | | 04360-1G62-M2123 | 5 | 2 | | | 06/01/05 | SWT-SAI-0255 | 04/14/05 | SAI-SWT-0345 | |
| 695 | | | 04360-1G62-M2123 | 6 | 1 | | | 07/22/05 | SWT-SAI-0263 | 06/17/05 | SAI-SWT-0355 | |
| 696 | | | | | | | | | | | | |
| 697 | | | | | | | | | | | | |
| 698 | Unit 1/2 | P & ID - Fundamental Systems Interconnection Diagram Unit 1 | 04360-1G62-M2124 | 0 | 2 | | | 03/20/03 | SWT-SAI-0036 | 01/27/03 | SAI-SWT-0014 | |
| 699 | | | 04360-1G62-M2124 | 1 | 1 | | | 05/21/03 | SWT-SAI-0054 | 04/10/03 | SAI-SWT-0033 | Telvent will issue final revision after all PIDs are approved |
| 700 | | | 04360-1G62-M2124 | 2 | PN | 05/30/05 | Telvent | | | | | |
| 701 | | | | | | | | | | | | |
| 702 | Unit 1/2 | P & ID - Fundamental Systems Interconnection Diagram Unit 1 | 04360-1G62-M2125 | 0 | 2 | | | 03/20/03 | SWT-SAI-0036 | 01/27/03 | SAI-SWT-0014 | |
| 703 | | | 04360-1G62-M2125 | 1 | 1 | | | 05/21/03 | SWT-SAI-0054 | 04/10/03 | SAI-SWT-0033 | Telvent will issue final revision after all PIDs are approved |
| 704 | | | 04360-1G62-M2125 | 2 | PN | 05/30/05 | Telvent | | | | | |
| 705 | | | | | | | | | | | | |
| 706 | | 10. Equipment Lists and Data Sheets | | | | | | | | | | |
| 707 | Unit 1 | Panels Lists Unit 1 | 04360.MS039. 6-18001 | 0 | 1 | | | 09/29/03 | SWT-SAI-0101 | 07/28/03 | SAI-SWT-0125 | Telvent sent letter SAI-SWT-0155 of 9/11/03. |
| 708 | | | 04360.MS039. 6-18001 | 1 | 1 | | | 06/14/04 | SWT-SAI-0216 | 05/06/04 | SAI-SWT-0271 | |
| 709 | | | 04360.MS039. 6-18001 | 2 | 1 | | | 06/13/05 | SWT-SAI-0257 | 05/13/05 | SAI-SWT-0350 | |
| 710 | | | 04360.MS039. 6-18001 | 3 | RE | 11/03/05 | TPC | | | 10/19/05 | SAI-SWT-0368 | |
| 711 | Unit 2 | Panels Lists Unit 2 | 04360.MS039. 6-28001 | 0 | 4 | | | | | 10/06/04 | SAI-SWT-0404 | |
| 712 | | | | | | | | | | | | |
| 713 | Unit 1 | Instrumentation Lists Unit 1 | 04360.MS039. 6-18002 | 0 | 2 | | | 03/28/03 | SWT-SAI-0039 | 03/06/03 | SAI-SWT-0023 | |
| 714 | | | 04360.MS039. 6-18002 | 1 | 2 | | | 09/26/03 | SWT-SAI-0100 | 07/14/03 | SAI-SWT-0099 | Telvent sent letter SAI-SWT-0155 of 9/11/03 |
| 715 | | | 04360.MS039. 6-18002 | 2 | 1 | | | 02/10/04 | SWT-SAI-0157 | 11/24/03 | SAI-SWT-0190 | |
| 716 | | | 04360.MS039. 6-18002 | 3 | 1 | | | 08/10/04 | SWT-SAI-0225 | 07/19/04 | SAI-SWT-0288 | |
| 717 | | | 04360.MS039. 6-18002 | 4 | 1 | | | 06/01/05 | SWT-SAI-0255 | 04/14/05 | SAI-SWT-0345 | |
| 718 | | | | | | | | | | | | |
| 719 | Unit 2 | Instrumentation Lists Unit 2 | 04360.MS039. 6-28002 | 0 | 4 | | | | | 10/06/04 | SAI-SWT-0404 | |
| 720 | | | | | | | | | | | | |
| 721 | Unit 1/2 | Condenser Sampling Pumps Lists Unit 1 | 04360.MS039. 6-18003 | 0 | 3 | | | 10/01/03 | SWT-SAI-0120 | 07/29/03 | SAI-SWT-0126 | Telvent sent letter SAI-SWT-0155 of 9/11/03. |

