

SECTION 12. QUALITY ASSURANCE

12.1 The processes of design, manufacture and installation of the flexible fuel hoses was conducted by organisations which had certified quality systems:

OAWA	ISO 9002	[E345]
ADI	ISO 9001	[E471]
Parker Enzed Technology	AS 3902	[E193 KMO4] and
	ISO 9002	[E216 RS7]

12.2 Quality systems (also called quality management systems or QMS) are ‘aimed primarily at achieving customer satisfaction by preventing non-conformity at all stages from design (production: ISO 9002) through to servicing’ [Scope, ISO 9001:1994]. The flexible fuel lines installed did not conform to the specified standard of Lloyds approval or to the necessary standard of fitness for purpose.[T2602] How could organisations with certified quality systems allow this to occur?

Reliance on Certification

12.3 During the hearing, WO Jones was asked ‘...is there any scrutiny or check made on behalf of Navy, or the Commonwealth, of RPLSS performance of that sort of obligation?’(supplied products meeting specified requirements) [T1958], to which he replied, ‘No’. WO Jones later explained [T1958-1960] that when goods arrive, the invoice is checked, ‘... and if companies have been suppliers to ADI and have the logo of the five ticks, quality accredited, ... (I am) heavily reliant on those sort of things, sir.’ Mr Sergeant explained his decision to invite Enzed to quote in these terms:

Although ADI had not contracted with ENZED before, I was aware from my own experience that ENZED is a specialist supplier of high performance industrial hoses and held a Quality System Certification to Australian Standard 3902.[E217 para 7]

12.4 The assumption that a certified QMS guarantees quality of product is not appropriate. Certification is gained by having documented procedures for design control, inspection and testing, control of non-conforming product, internal quality audits and so forth. Unless the documented procedures are well written, reflect customer requirements and are rigorously implemented, certification is meaningless to the customer.

12.5 Internal quality audits are conducted regularly in order to ensure conformance and applicability, and maintain certification. If these audits are not conducted correctly, inappropriate procedures can continue unchecked, appropriate procedures can be ignored, and non-conforming product can continue to be provided to the customer.

Navy

12.6 With the introduction of RPLSS type contracts, the contractor drafts the work instruction, and thus the type and number of QA inspections and hold points. Under this system, the Navy must ensure that QA requirements are adequately explained in the TM200. Contract managers and ships’ staff must then ensure that the Work Instruction raised by the contractor reflects these requirements.

12.7 As the QA involvement was previously set by the Ordering Authority in consultation with the ship, guidelines may be required to assist ship's crews in determining the appropriate type and frequency of inspections, based on risk, type of job, and experience of personnel.

Recommendations

12.8 RAN contract managers and ships' staff should thoroughly check work instructions to ensure that all requirements are accurately specified and the appropriate level of QA checks are included.

12.9 Work should not be accepted until all QA requirements have been met, including the provision of the appropriate documentation.

OAWA

12.10 OAWA's Quality Plan and Standard Operating Procedures were out of date, CMDR Coverdale stating 'I am painfully aware the quality management system does need updating'. [T3292] The SOP for WESTRALIA contract management [E296 SOP 200] is only 9 pages long, of which 5 pages are examples. The SOP refers to the previous contract for logistic support for WESTRALIA. When read in context with the rest of OAWA's procedures the SOP does not provide adequate guidance on:

- a. Handling TM200s
- b. Validating Work Instructions raised by the contractor
- c. Processing SG2s
- d. Procedure for CCPs
- e. Planning a maintenance period (for WESTRALIA)
- f. Managing a maintenance period

12.11 Indeed, the only existing SOP for assessing the technical merit of TM200s [E302], was discarded when the responsibilities of FIMA Perth and OAWA changed in late 1997:

... OAWA has endeavoured to provide an uncompromised, customer oriented approach towards the ship and support craft it is tasked to support. In particular, this has included ... the removal of previous procedures for the rejection of forms TM200 ...[E345]

12.12 The absence of any technical assessment of the TM200 and the work instruction in relation to the flexible fuel hoses was central to the problem which occurred. OAWA SOPs did not address in any way how these important assessments were to occur under the RPLSS contract.

Conclusion

12.13 The quality management system of OAWA is inadequate, particularly in relation to the management of maintenance for WESTRALIA.

Recommendations

12.14 OAWA's SOPs should be updated to reflect the WESTRALIA RPLSS contract.

12.15 SOPs for all RAN contract managers should address each type of maintenance process in which the contractor is involved, clearly defining the responsibilities of both parties.

12.16 RAN contract managers should insist on receiving all appropriate quality documentation (including test certificates and opening/closing reports) and check them for accuracy and completeness prior to approving payment.

ADI

12.17 The ADI Project Quality Plan [E131] refers to a set of standard procedures, including a procedure for service design control (SP 04.01 Issue 2.2 [E469], superceded by LSP 04.01 Issue 1[E470]). This procedure applies to all sub-contractors, and includes the 'development of proposals to fully meet a customer's requirements'. This procedure includes raising a set of instructions that will:

- a. Meet the design input specification,
- b. Contain or reference acceptance criteria,
- c. Conform to appropriate regulatory requirements whether or not these have been stated in the input information, and
- d. Identify those characteristics of the design that are crucial to the safe and proper functioning of the service (service being defined as work carried out by the company). [E469 para 4.6]

12.18 The procedure states that a record of service design or validation will be maintained, and an example form is provided (F S0401 Issue 2.2 [E469]). In the documentation provided by ADI [E103] there was no S0401 for the flexible fuel hose work.

12.19 Coincidentally, an internal QA audit (LSP04.01 – Design Control) was conducted for the flexible fuel hose task after the fire.[E221 SS4] The audit assessed conformance to the procedure as satisfactory.

12.20 The internal audits were conducted by following the given questionnaire. [T3775] The questionnaire for design control [E221 SS4 0000085] addresses the numbering of documents, rather than the content. This means that the audit can not determine if responsibilities are being fulfilled. Indeed, ADI's Internal Auditor Mr Singh stated that he very rarely looks at the content of documents.[T3778] In the case of the

flexible fuel hoses documentation, this meant that the auditor assessed the work instruction as satisfactory, even though it had various formal defects, none of which he noted.[T3779]

12.21 An external audit of ADI Rockingham was conducted after the incident, including a review of Mr Singh's audit of the flexible fuel hose documentation.[E221 SS5] This audit included review of the flexible fuel hose work and was surprisingly positive in the light of the deficiencies demonstrated to the Board [T3779-3781]. The summary of the audit noted in part that:

...the system was found to be well documented and effectively implemented in accordance with the standard. All personnel involved are to be complimented.

12.22 Despite the contractual requirement to maintain suitable quality records to be able to demonstrate the achievement of the required quality [T3784], Mr Singh conceded that that no-one in ADI considered the adequacy of the documentation for the flexible hose job. He also admitted that the positive findings by the external auditors were extraordinary [T3786] and that ADI's quality responsibilities had not been duly discharged [T3787].

12.23 Of particular concern in a quality assurance sense, is the absence of objective evidence to warrant satisfactory findings by two ADI audits of management responsibility [T3797-3800]. In response to the question 'Has the responsibility, authority and inter-relationship of all personnel who manage, perform and verify work affecting quality been defined?' Mr Singh agreed that other than the generalities of the ADI RPLSS Project Quality Plan [E131], there was no documentation of the specific responsibilities of his office.

Conclusion

12.24 The internal and external quality audits of the ADI quality management system failed to identify significant deficiencies in the implementation of that system

12.25 The ADI SOP for Service Design Control was suitable to ensure an adequate product. That procedure was not followed, however, and internal and external audits failed to detect this situation.

Parker Enzed Technology Organisation

12.26 Mr Old was unsure of whether he was working in a quality certified organisation, and what the implications were. For example, he was unable to answer the question 'Are you quality accredited?' [T3129]. His business card displays a quality accreditation that appears to be by association with the Parker Enzed Technology organisation. Mr Old believed that he was required to provide certain documents for quality checks as part of his franchise agreement.

12.27 In any event, procedures that are normally expected as part of a quality system were not carried out. For example:

- a. No test certificate or entry into the test register was made of the hose that failed the pressure test [T3061]. The only documentation recording the failure was the open and closing statement, which the ship had not

received at the time of the incident. (ISO 9002 Inspection and Test Records Criteria)

- b. Mr Old did not keep the length of hose that failed, or inform anyone that a failure had occurred, or investigate the cause of the failure himself.[T3063] (ISO 9002 Corrective Action Criteria)

Conclusion

12.28 Mr Old was unaware of his quality assurance responsibilities and had not been adequately trained in relation to them.

Defence Accreditation and Auditing Policy

12.29 Part of the problem for Navy may be the reliance on third party accrediting organisations that are hired by the company being audited. There seems to be little incentive for the accrediting organisation to be particularly rigorous when their future depends on satisfied customers (the hirer). A different attitude might occur if the third party organisations were contracted by Defence.

Recommendation

12.30 Defence should re-examine the policy of quality accreditation for companies engaged in Defence work with a view to contracting the accrediting organisations to work on Defence's behalf. A price reduction resulting from the transfer of responsibility for the work should be vigorously pursued.