
***Current situation of QMS certification by JET
based on JIS Q 8901***

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Yasunori Uchida

RESEARCH & BUSINESS DEVELOPMENT CENTER

JAPAN ELECTRICAL SAFETY & ENVIRONMENT TECHNOLOGY LABORATORIES

一般財団法人 電気安全環境研究所

JET

1. Introduction
2. Outline of JIS Q8901
3. Major requirements defined in JIS Q8901
4. Major check points
5. Outcomes of the JET Certification audit
6. Summary

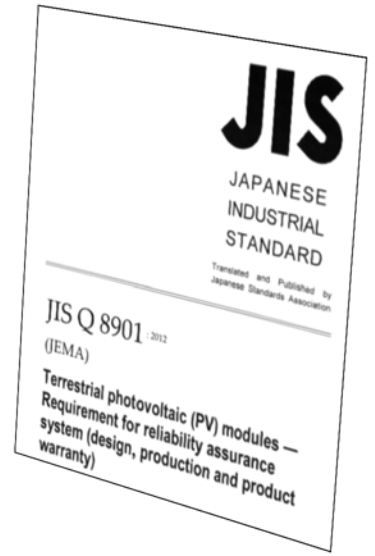
- ◆ July, 2011:
 - First International PV Quality Assurance Forum in SF, USA, organized by NREL, JRC and AIST.
 - Formed the 5 task Group
 - ✓ Task 1 : Quality Management System
 - ✓ Task 2-5 : Accelerated tests (NOTE: *11 Task Groups form now)
- ◆ Fall, 2011:
 - Task #1 began to write a PV-specific version of ISO 9001
 - Status of TG1 and QA forum activity was reported in IEC/TC82/W2 meeting and International QA forum.



- ◆ **TG1 Members:**
 - Grobal coordinator : Ivan Sinicco (TEL solar)*
 - U.S.A Leader: Govind Ramu (SunPower Corp.)*
 - Europe Leader: Gunnar Brueggemann (TEL solar)*
 - China Leader: Wei Zhou (Trina solar)*
 - Japan Leader: Yoshihito Eguchi (JET)*

- ◆ **Report at**
<http://www.nrel.gov/docs/fy13osti/58940.pdf>

- ◆ **Establishment of the JIS standard (Feb.2012)**



- ❑ JIS* Q8901:Terrestrial photovoltaic module – Requirement for reliability assurance system (design, production and product warranty)
(JIS*: Japan Industrial Standard)

- ❑ Developed by JEMA** based on suggestions from PVQAT TG#1 Japan Team
(JEMA**: The Japan Electrical Manufacturers' Association)

- ❑ Defines requirements for QMS in design, production, and product warranty to secure power output warranty of the PV modules.

- ❑ JIS Q8901 certification by members*** of Japan PV Module Certification Bodies Council (PVCBC) started in Jul, 2012 .
(***JET, TUV-Rheinland, UL, VDE)

- ❑ Full text in English can be purchased at
<http://www.webstore.jsa.or.jp/webstore/Com/FlowControl.jsp?lang=en&bunsyold=JIS+Q+8901%3A2012&dantaiCd=JIS&status=1&pageNo=0>



4. Quality management for design, production and performance warranty

4.1 Consistency of functional lifetime with design and production

4.2 Consistency of functional lifetime with performance warranty

4.3 Reliability ensured in design

4.4 Quality management for production (ISO-9001 7.5)

4.5 Performance warranty for product after delivery

5. Retention of records

- ❑ The party for product liability to ensure that functional lifetime is consistently insured in design and production of PV modules. The party may subcontract some of its responsibilities for design, production and power output performance warranty to third parties.
- ❑ The performance specified in the warranty ensured by the combination of reliability of product itself and warranty services over the period specified in the warranty.
- ❑ Functional lifetime set in accordance with features and installation conditions of the PV modules.
- ❑ The rules and systems for managing and controlling the design process and verification method of the design output to ensure reliability of the PV modules
- ❑ appropriate verification items and methods to verify if the specified performance of the PV module can be expected over the functional lifetime.
- ❑ proper verification items and methods for the reliability of specified performance in the function lifetime for cell, key materials, ,connection method and internal circuit.

- ❑ To notify an installer of PV modules of precautions for use and/or installation if necessary
- ❑ Manufacturing of PV modules managed under Clause 3.5 (manufacturing and offer of service) of JIS Q 9001.
- ❑ Consistency between the contents of performance guarantee of PV modules and the operational rules and systems.
- ❑ Disclosure of contents of performance guarantee, guarantee conditions pertaining to it and matters necessary for after-sales-service as warranty to the purchasers of PV modules.
- ❑ To organize the system for service etc. to secure the guarantee.
- ❑ The rules and/ or structure for the receipt of consultation requests from purchasers when some problems occur, diagnosis to identify the problem, compensation after it was identified, measures for preventing the recurrence, etc.
- ❑ The corresponding rules in case of the occurrence of severe troubles.
- ❑ Retention of the records necessary for the operation of services during the period of performance guarantee.

- ❑ Consistency of functional lifetime with design and production
- ❑ Consistency of functional lifetime with performance warranty
- ❑ Scheme for ensuring "Performance lifetime" in the case of "Functional lifetime" < "Performance lifetime", has to be documented
- ❑ Documents that provide the installation conditions
- ❑ Documents that specifies conditions exempting the performance warranty.
- ❑ Rules and procedures to ensure the functional lifetime of the modules embodied in the design including verification methods of the design.
- ❑ Reliability verification methods for key materials and/or connection method.
Ex. Cell, Back-sheet, EVA, Glass, Al-frame etc.
- ❑ Quality management/control system for manufacturing
Ex. Certificate of ISO9001, Audit report, Non-conforming result, corrective actions, range of certification, etc.
- ❑ Change control system for design, manufacturing process, and key materials.

- ❑ Relationship between contents of performance warranty and operational rules for warranty services
- ❑ Presentation materials for customers on "contents for performance warranty" and "necessary information concerning the warranty conditions and after service."
 - Ex. Model for warranty, product warranty, warranty period, contents of warranty
- ❑ Service system to ensure the warranty
 - customer communication (language)
 - problem/trouble handing including diagnosis of suspicious modules and definition of severe trouble
 - education and training of service staff
 - recurrence prevention
 - record retention and management system for service operation (as long as "product warranty period + one year")
- ❑ Rules and procedures to protect customer's information.

- ❑ JET started the QMS certification service from July 2012.
- ❑ Inquiries from many companies (PV module manufactures and sales agent), including from overseas
- ❑ JET communicated potential customers on requirements defined in JIS Q8901
- ❑ Some customers applied for JET audit and successfully acquired QMS certification.

Comments from the auditees

- Through preparation for JIS Q8901 we were able to have good opportunity to reconsider with a long-term reliability assurance.
- Verification of a functional life-time printed on the label.
ラベル上の印刷の機能耐用年数の証明
- Acceptable business scheme to ensure product warranty in case of withdrawal from PV business or bankruptcy.
業務撤退や倒産等の場合の対応の仕組み等
- Requirement for after-sales service stations in Japan.
日本でのアフターサービスの拠点

Comments from JET auditors

- This is not a goal, it is a beginning rather.
- In the future, to more ensure “a long-term reliability assurance”, it is important to perform the continuous improvement concerning the verification method and system.
- Functional lifetime in design should be validated by outdoor exposure data of similar product of as many years as possible.
長期信頼性に関し、できるだけ長期の曝露データに基づき設計を進めていくべき。

Comments from companies declined from application for JET audit

- They gave up the acquisition of QMS certification due to one or more of the following reasons,
 - ✓ No/insufficient outdoor exposure testing data.
 - ✓ No rules/systems to assure the long term reliability.
 - ✓ No/insufficient testing data for various materials.
 - ✓ No/insufficient records to assure quality of key materials.
 - ✓ No “after sales service center” in Japan.
 - ✓ No “after sales service system” in Japan.
 - ✓ No rules for the replacement of failure PV module.
 - ✓ No education and training system.
 - ✓ No processing rules if the PV module business is closed.
 - ✓ The storage period is not "the guarantee + more than 1 year".
 - ✓ No rules and evidence for identify the products.

- JET has audited 8 companies for certification of JIS Q8901. All of them successfully passed and acquired certificate.
- Some companies gave up application on the half way of their preparation for the audit, who realized that they were not able to satisfy the requirements at that time.
- JISQ8901 is not perfect standard to secure PV module reliability. With "continuous improvement" concept featured in the policy of ISO9001, further review and action is needed from now on.