

## Item/supplier performance record for CGD through CPE

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### 1. Introduction

Commercial Grade Item Dedication (CGD) is one of the efforts to ensure reasonable assurance of items from suppliers that have recently abandoned Nuclear Quality Assurance (NQA). The CGD method-4 presented in EPRI 3002002982 [1] cannot help focusing on the use history of technical evaluation (TE) and acceptance process (AP) of products rather than repetitive qualification when attempting to apply products available in IT industry to nuclear power plants.

This paper explains CGD support for the usage history of products in relation to product management in the IT industry, and utilizes its purpose to provide issues for the initial work of standardization of operating history for Method-4 in [1]. Also, specific regulatory expectations for the use of a supplier's or item's performance record are included in NRC GL 89-02 [4]

There are many examples like this category of commercial products, including the (wireless) communication protocol presented by IEEE, military cybersecurity chip, and general industrial valves, pumps, electronic device and digital products.

### 4. Method-4: Performance history

One of the acceptance methods is "Method 4: Item/Supplier Performance Record" in [1]. Although this method is recommended to be combined with other methods, it'll be necessary to systematic maintenance of performance history to support better result of CGD.

The performance history (good or bad) of the item and supplier is a consideration when determining the use of the other acceptance methods and the rigor with which they are used on a case-by-case basis. Specific regulatory expectations for the use of a supplier's or item's performance record are included in NRC GL 89-02 [4]. The item/supplier performance record is typically used as a factor in the selection of sampling plans when verifying physical and performance characteristics associated with hardware. §10 of this report [1] covers item/supplier performance in more detail."

To support this method, performance record shall include according to [1];

- 1) Identification of the item, service, or supplier being evaluated
- 2) Identification of the critical characteristic(s) being evaluated specific to the item, service, or supplier

- 3) Identification of the data examined to evaluate the item, service, or supplier performance
- 4) Identification of the basis for determining that the performance data substantiate the acceptability of the applicable critical characteristic(s) for the item, service, or supplier
- 5) Documentation of the adequacy and acceptance of the item, supplier, or service performance record
- 6) Any limits or stipulations on the application of Method-4 for acceptance of the applicable critical characteristic
- 7) Procurement document requirements and any supplier submittals necessary to support the Method-4 acceptance

### 2. Complete Product Experience (CPE)

This is an attempt to introduce the concept of CPE [2] in the general IT field to systematically organize "performance history" in Method-4, which is a method of accepting CGI in the nuclear field.

What are the components of a Complete Product Experience? Besides thinking about the actual product or service you provide; you need to consider the other interactions that contribute to people's experience with your product.



**Figure 1 Factors for product management**

These might include the technology you use to deliver your product, how responsive your internal teams are to

new requests and ideas, and what kind of support you give customers. Figure 4 shows the key touchpoints you have with each customer. These all equal up to the CPE. Among these factors, technology is major item of CGD, as part of issues for Method-4 in [1].

What are the core features that customers pay for and what technology does your company use to deliver these features? Customers expect the technology and platforms they use to be more than functional — they want a frictionless experience without interruptions and glitches.

### 3. Features for TE and AP

According to Figure 1, the elements of built-in quality and confidence building, which are the perspectives of CGD technical review and acceptance, can be matched with the CPE elements.

**Table 1 Mapping CPE and CGD activities**

CPE	Built-in/Confidence building
Policy	Procurement
Marketing	CGI dedication
Sales	Supply chain management
Technology	Technical evaluation 1) Critical characteristics 2) Performance 3) Maintenance and surveillance 4) EQ, SQ qualification database
Supporting system	Experienced organization 1) Supplier's response on questionnaire
3 <sup>rd</sup> party integration	3 <sup>rd</sup> party inspection 1) Audit and survey
Support	Training and education

### 5. Method-4 and CPE

So far, this have looked at the relationship between IT industry CPE management and CGD's Method-4. Through this comparison, this paper would like to raise the issue of product management (PM) standardization in transit CGD with reference to CPE. The topic of PM for CGD is proposed as follows.

- 1) Performance history
  - design life cycle verification performance history (configuration management-based version control, NCR, MTBF, customer report and response etc.)
- 2) Operating history
  - Product identity,
  - Customer identity,
  - reference site.
  - use case

### 3) Market share

This is not a technical evaluation, but indirect information about the product's reputation.

### 7. Conclusion

Considering trends in the nuclear industry and improvements in IT industry technology, efforts to apply commercial grade item (CGI) into nuclear energy will accelerate. And as part of this, there is a need to systematically manage the operation and performance history to support reasonable assurance of existing commercial products. This field is an expansion and development of the topics of EPRI 3002002982 and IEC 63413[3], and future standardization research is needed.

### REFERENCES

- [1] EPRI 3002002982, Plant Engineering: Guideline for the Acceptance of Commercial-Grade Items in Nuclear Safety-Related Applications Revision 1 to EPRI NP-5652 and TR-102260
- [2] <https://aha.io/roadmap>
- [3] IEC 63413, Nuclear Power Plants - Instrumentation and control systems important to safety - Platform qualification (Under development)
- [4] NRC GL 89-02, Actions to Improve the Detection of Counterfeit and Fraudulently Marketed Products