



QR VIEWS

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FOR PRIVATE CIRCULATION AMONG MEMBERS ONLY

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1.0 Chairman's Message



For the sustainability of an organization Quality plays a major role. A Quality Person makes a set of rules or follow established standards which are implemented to achieve the desired result. This year's World Standards Day theme emphasize on Sustainable Development Goals as envisaged by UN. The significance of the theme is very important to make sure the products and services work the way that we expect them to. In this regard the Quality Professionals need to play a pivotal role. Members of the International Electrochemical Commission (IEC), International Telecommunication Union (ITU) and International Organisation for Standards (ISO) emphasize "Shared Vision for a better World" in this year 2022. The vision broadly address social imbalances, develop a sustainable Economy and slow the rate of climate changes. The vision described is highly ambitious and to achieve this require cooperation of Public and Private partners. As we face an urgent challenge to "build back better" brought by Covid 19, the Quality Professional plays a pivotal role in it. If we do our actions with Quality Conscience definitely we will be doing the right thing.

2.0 One day workshop

During Post corona period, different incidents were reported due to food poisoning. To make aware of Food safety , NIQR conducted a one day workshop on "Food safety, Standards and HACCP" on 18-06-2022 at Hotel Residency Tower, Trivandrum. More than 40 participants working in food industries were benefited from the program. Canteen Chefs, Managers, Cooks, Supervisors, Engineers from various ISRO centres, PRS Hospital, HLL Lifecare ltd., and professors from IIST have attended the workshop. Shri A. Govindan and Shri P. Mohan who are having decades of experience in this field conducted the Workshop.

A bad workman blames his tools

-Proverb

The most dangerous kind of waste is the waste we do not recognize.

-Shigeo Shingo

Happy New Year



Topics covered in the Workshop:

- Why and what is Food safety
- Food safety standards and norms
- ISO 22000: The requirements for a food safety management system
- HACCP in food safety. Analysis and control of biological, chemical and physical hazards from raw material production to distribution.
- Foodborne illness and how to manage them Etc.



During inaugural function of workshop.



An interactive session



Technical talk titled “Role of characterization in material quality” was held on 18, July 2022 at Hotel Pankaj, Trivandrum. The talk was delivered by Dr. Ramesh Narayanan, GD MMG. He has more than three decades experience in material science and characterization of metals for various projects of ISRO. In his talk he covered types of defects and how it is characterized during different stages of processing. The lecture specifically covered the role of microscopic evaluation on change of textures due to nonconformance in the process parameters. Various microscopic images of failed specimens were also presented with insight on how they failed. Dr Ramesh Narayanan superannuated on July 2022 from ISRO. To appreciate his contribution to NIQR, a felicitation function was also conducted after the talk. NIQR office bearers highlighted his support and contribution to NIQR Trivandrum branch activities. Shri.Nedumaran EC Member of the Branch presented a Memento to Dr.Ramesh Narayanan on behalf of NIQR Trivandrum Branch.

Shri.T J Thomas senior member of NIQR was Felicitated on that day. His contribution to NIQR during '90s was recollected by C.Athi Pagavan Chairman of the Branch. Shri.T J Thomas shared his experience in the field of Quality in both Spacecraft and Launch Vehicle with the members present. Shri.M.Ravindranathan senior member of the branch honoured Shri.T J Thomas with a ponnada.

Honouring Shri.T J Thomas with a ponnada



Obituary

The following life members of NIQR Trivandrum Branch passed away recently. Team NIQR appreciate their contribution to our branch activity. May the departed souls Rest in peace



K M Kalyanasundaram



J Joseph

4.0 Redundancy and Reliability - An Overview

Redundancy is a common approach to improve the reliability of a system. Existence of more than one means of accomplishing a given task is redundancy. Various methods or techniques exist for implementing redundancy.

System redundancy may be obtained in two ways. i.e,

- (i) Low-level redundancy in which each component comprising the system may have one or more redundant (parallel) components
- (ii) High-level redundancy where the entire system may be placed in redundant with one or more identical items. Low-level redundancy is generally preferred over high-level redundancy because of its higher reliability and lower replacement cost.

Redundancies can either be configured with (1) Active redundant systems or (2) Standby redundant systems.

Active redundant system: A redundant system where all redundant units are in operation and are sharing the load with main unit is called active redundant system. They are commonly classified as

- **Simple parallel:** A System that operates successfully if at least one of the elements operates successfully. All the elements in the system must fail for the system to fail.
- **Series-Parallel model:** Systems that typically contain both serial and parallel relationships.
- **K out of n model (Majority voting):** A minimum of k elements out of a total of n operating successfully is adequate for system success.

Standby redundant system: A system is called a standby redundant system when some of its units remain idle until they are called for service by a sensing and switching device. The standby model uses redundancy like parallel model, except that the redundant unit is in an off-state (not exercised) until called upon to replace a failed unit. The redundant components do not share any amount of the load with the main component and they start operating only on demand. The sensing and switching system may be an automatic part of the system or may require some manual interface.

Standby system is not energised as in the simple parallel system and thus does not have same opportunity of failure. Hence, standby redundant systems are generally much more reliable than active redundant systems (depends on the probability of failure occurring when switching to a standby unit). A two component standby system differs from active redundant system where standby units will have no failures or lesser failure rate in standby mode. Once active, the backup unit may experience same failure rate as prime (if they are identical units) or may have different failure rates. The dependency arises because the failure rate of standby units depends on the state of primary unit.

Various types of standby redundancies are adapted based on requirements. Some of they are

- **Cold standby:** The system may have perfect/imperfect switching. It is assumed that secondary components in standby mode do not fail, i.e., failure rate of the standby unit when it is not operating is zero.
- **Hot standby:** The standby component may fail without being operated because of limited shelf life, i.e., when the failure rate of the standby unit is same as the main unit.
- **Warm standby:** When the failure rate of the standby unit is lesser than that of the main unit.

At last, regardless of the type, adding redundancy increases cost and complexity of a system design and with the high reliability of modern electrical and mechanical components, many applications do not need redundancy in order to be successful. However, if the cost or penalty of failure is large enough, redundancy may be the most common, cheapest and attractive option for improving system reliability.

SS Maruthi, VSSC



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