

## Capturing and Leveraging Lessons Learned and Leveraging for Continuous Improvement

### Introduction

Lessons Learned (LL) programs are the effort to collect the experiences, both positive and negative, which result in further knowledge and understanding for the purpose of disseminating throughout an organization to improve the institutional knowledge. The aspiration of these programs is that by improving institutional knowledge, fewer similar mistakes will be made, quality and efficiency will improve, first costs and operational costs will decline, e.g., Continuous Improvement (CI) will be realized. In practice, however, LL/CI programs are notoriously prone to abandonment, failure, and decline. Although the potential causes for these programs to fail are multifold, the program described in this article seeks to address many of the common causes (accessibility of LL & CI, filtering of LL to actionable and applicable items to fit the subsequent need, LL are well documented, and the collection process is open and unobtrusive).

### Lessons Learned Tool for APFs

DTR's Facility Compliance and Inspection Section (FCIS) developed the concept and business logic for a novel Lessons Learned web application tool, which was built and deployed by DTR's, Enterprise Facilities & Asset Management Information Technology (DTR EFAM IT). Currently, this tool is in the final testing stage and expected to be released for broad use in August 2023.

The tool's interface provides users with a procedural filtering system to allow users to narrow their search either via a typical keyword search, or additive filtering against pre-populated meta-data tags associated with each entry in the database. The additive filtering approach is intended to maximize the return of hits when the user is searching for the maximum number of potentially related LL/CI responses and is anticipated to be the most used navigational feature.

For example, LL/CI developed in temperature and humidity control of an electron microscope may be of value to someone executing a chemotherapy infusion bay, but the project team would likely overlook the data if conventionally presented (e.g., by project name or type instead of being meta-data tagged to include specific close-tolerance controls of temperature and airflow). The database is also designed to associate the LL with the phase of the project it may be associated with, so that the user can make use of the LL as early as possible in the development of the project, since cost and effort to implement changes increase rapidly over time (e.g., as design and

construction progresses). The application also allows users to nominate new LL which would be reviewed for content, meta-data tagging accuracy, and actionability before being publicly viewable. Users can also provide feedback on how useful they found an LL/CI, to allow for filtering and eventual removal of LL/CI which are later found to not be practices.

### Continuous Improvement

Although actionable LL can be identified and applied to any project type, the tool is directly integrated into an FCIS workflow for APF-related activities. This workflow includes data collected via change control activities, Root Cause Analysis (RCA), System Deviations (SD), Corrective and Preventative Actions (CAPA), and other QA activities, including design review, construction observations, oversight of DFOM activities, etc.

LL are tracked through implementation and post-execution assessment and data from these assessments are then added to the LL/CI cards and made available to all users of the system. Some LL are tracked over time to validate the effectiveness of those improvements over time, particularly those which need to demonstrate seasonal stability, long-term durability, or other characteristics which cannot be fully assessed immediately following execution.

### Conclusion

Currently, the web app is pre-populated with a collection of LL/CI data, but it is open source, meaning individual users can and should contribute additional data that may be of use to others at NIH who will be doing similar work in the future. It is this user-dependent content creation which will be the measure of how successful this tool will become. This, however, will require participation by all stakeholders, both in content creation and use, which will lead to rapid improvement of the content and value of using this tool.

Access to actionable LL/CI information reduces the possibility of errors being repeated and the increased sharing of institutional knowledge of best practices encourages the likelihood of more implementation across similar instances/requirements. Across ORF there are several groups interested in developing LL/CI programs; it is the author's hope that this diversity of programs will not act as an unintentional barrier to the sustained development of an overall high-quality LL/CI program for the benefit of NIH.

### Additional Reading

1. NIH Design Requirements Manual, Chapter 13

