The Pb-free Manhattan project, was conceptualized by Ed Morris (Lockheed Martin) and Dave Humphrey (Rockwell Collins), and a few others, as a means of conveying a certain amount of gravity to the DoD over the inevitability that Pb-free materials will make their way (inadvertent or otherwise) onto the A&D product stream.

The current Phase I is a funded by the Office of Naval Research through the B2PCOE, and is a collaborative effort to bring the top experts , which include Drs. Tony Rafanelli (Raytheon) and Stephan Meschter (BAE Systems), among others, to try to abet the tide of misinformation on Pb-free, and to document what are generally the current baseline practices toward mitigation of lead problems. The group included Web X presentations of other presenters who were not part of the entire two week session, but were asked to present in their field of expertise. Dr Henning Leidecker of NASA Goddard SFC was among them. (http://nepp.nasa.gov/WHISKER/)

What was found during the two week working session is that there are many gaps and unknowns in the areas of design, manufacturing, reliability, sustainment, and testing that would be cause for concern should Pb-free make its way into the A&D product stream. The group is in this middle of editing the document for electronic publication which will be accessible at the B2PCOE website sometime in July or early August. This will be an expandable document via our wiki, where you can add articles, references and additions to the report. This is a way of keeping it contemporary.

Additionally, the group is currently prepping for the Phase II which will cover the technology gaps and present a roadmap of research projects to address them. This is occurring on the weeks of Aug 17th-28th. In order to maintain continuity, the same participants will be asked to formulate a strategy. This effort is being funded jointly by different branches of the DoD, including the Navy.

The Web site link is http://www.navyb2pcoe.org/b2p_news.html

Phase 1 overview

The objective of this effort is to capture industry-wide Pb-free electronics best practices and to develop an integrated industry/government plan to mitigate future risks posed by the worldwide transition to Pb-free electronic products. This scope of this effort will be to assemble leading Subject Matter Experts (SME's) and have them collectively define the current set of best practices in use to mitigate the risk associated with Pb-free electronics usage in DoD applications and then to develop an action plan to mitigate future risks.

These best practices would be used to provide uniform guidance for hardware providers and end users in order to establish a common framework for actively managing the unplanned intrusions of Pb-free electronics into current aerospace and defense weapon systems and handling the reliability and sustainment of Pb-free electronics in future systems.

The need for the Department of Defense (DoD) to accommodate the global movement to lead (Pb)-free electronics in response to the European Union law known as RoHS (Restriction on Hazardous Substances) has caused the various DoD

services and agencies to initiate individual (inconsistent, uncoordinated approaches to Pb-free electronics through the use of Mission Assurance Plans (within MDA), Air Worthiness Directives (within Air Force), and other equally uncoordinated reactions. The DOD would be better served with a consistent approach to this dilemma, saving significant money and time by avoiding the requirement for the various DOD materiel suppliers to have a common approach to Pb-free electronics.

Phase 2 overview

The dissemination of the best Pb-free mitigation practices having been established through the Pb-free Manhattan Project Phase I activities, requires identification of technological and manufacturing gaps to mitigate the effects of the worldwide movement to Pb-free electronics, and remove impediments to the progressive adaptation of the documented best practices. DoD Mission Critical programs are the most susceptible in the worldwide movement to adapt Pb-free processes and materials as the standard in the manufacturing of electronic assemblies. The recommendations made from Phase I have been developed for the purpose of consolidating data and information to assure a minimum risk associated with the use of manufacturing processes which have required modification due to introduction of Pb-free materials. The electronic manufacturing industry has identified these gaps as areas of weakness in the Pb-free mitigation models where further research is needed to prevent the uncertainties in reliability due to the disparity between existing Sn/Pb knowledge base, and the more limited Pb-free data pool.

The need for the Department of Defense (DoD) to accommodate the global movement to lead (Pb)-free electronics in response to the European Union law known as RoHS (Restriction on Hazardous Substances) has caused the various DoD services and agencies to initiate individual (inconsistent, uncoordinated) approaches to Pb-free electronics through the use of Mission Assurance Plans (within MDA), Air Worthiness Directives (within Air Force), and other equally uncoordinated reactions. Phase II of the Pb-free Manhattan Project, through Gap analysis and Road-mapping, will better serve the Department of Defense with a methodology to select critical projects in Pb-free electronics leading to a much more consistent approach to this dilemma. This will save significant money and time by allowing the various DoD materiel suppliers to have a common “open systems” approach to Pb-free electronics for use in the DoD.

Phase II of the Pb-free Manhattan project will assemble the same small group (~15) of recognized experts in Pb-free electronics as were involved in Phase I for an additional very concentrated effort to identify, from the Phase I known best practices documentation, the technological Gaps that introduce risk into each Pb-free best practice. A Roadmap for Pb-free accommodation by the DoD will then be generated and documented. Documented Gaps and the Pb-free Roadmap will then be used to provide uniform guidance for proposal, funding, and execution of future Pb-free electronics process or materials improvement projects.

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