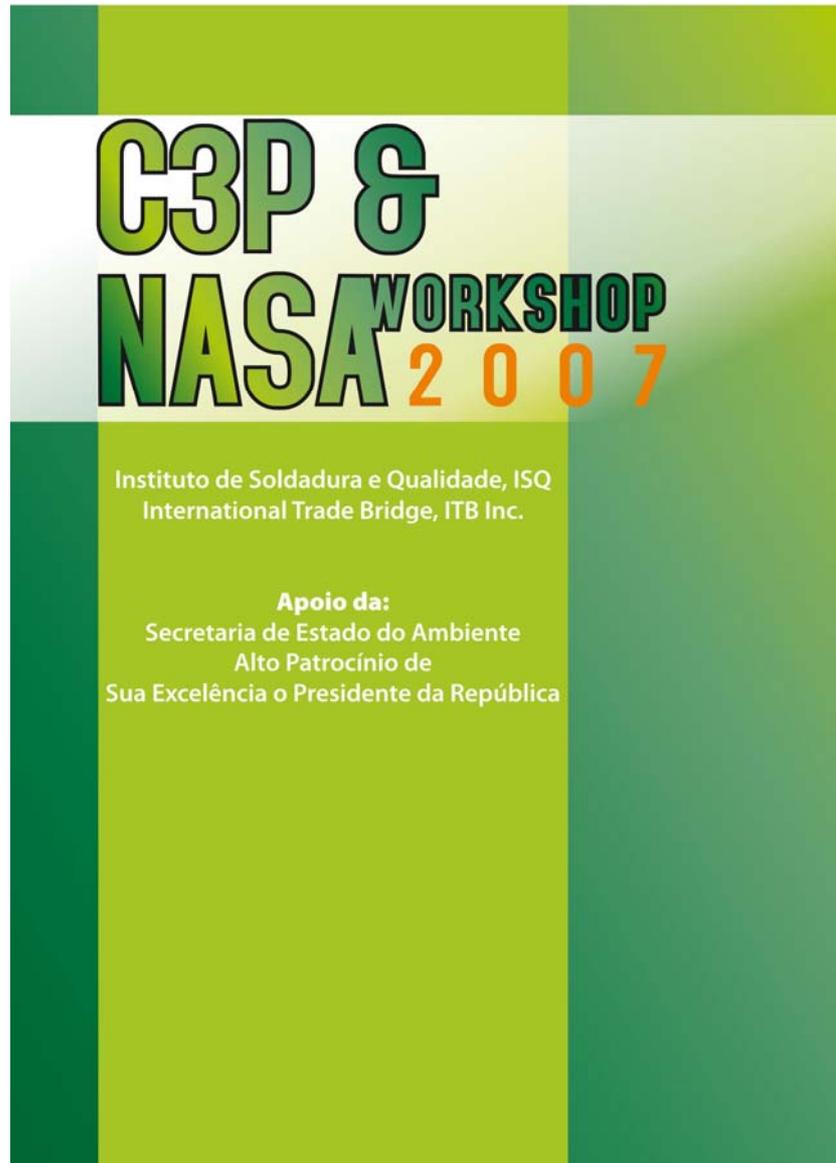


Summary Report for
C3P & NASA Technical Workshop 2007



Centro Para Prevenção da Poluição (C3P)

November 2007

Executive Overview

On 7, 8 & 9 November 2007, the Centro Para Prevenção da Poluição (C3P) and the National Aeronautics and Space Administration (NASA) hosted a technical workshop at the Escola Superior de Tecnologia do Mar (School of Maritime Technology) in Peniche, Portugal. This event was supported by the Secretaria de Estado do Ambiente, and under the High Patronage of His Excellency the President of Portugal.

The three-day workshop provided an excellent forum to receive up-to-date information on environmental and energy concerns that are common to Portuguese, European and U.S. industries, as well as information on ongoing and future projects. Of particular emphasis, several technical sessions were devoted to the environmental and energy improvements planned for the Berlenga Island.

In total, 243 individuals from eight countries attended the technical workshop. More than 45 international scientists, technologists, and engineering experts presented PowerPoint slides on topics ranging from island sustainability, renewable energies to restricted chemicals and advances in materials and conventional processes, green chemistry, lead-free soldering and advances in coatings and coating removal.

This exchange of solutions provided direct and tangible benefit to attendees from academia, defense, and commercial industries.

The workshop began with welcoming comments from the President of the Escola Superior de Tecnologia do Mar, Prof. Júlio Coelho, and from the Mayor of Peniche, Dr. António José Correia. Welcome remarks were also made by Mr. Alfred Hoffman, U.S. Ambassador in Lisbon. A video with a statement from the Prof. Humberto Rosa, Secretary of State for the Environment was shown.

The C3P Director, General (ret.) Pelagio Castelo Branco, began by thanking all participants and guest-speakers for their attendance and contributions, and showed his appreciation for the efforts and collaboration of the Escola Superior de Tecnologia do Mar, the host and co-organizer of the Workshop, as well as to the Instituto Politécnico de Leiria, under which the Escola is managed. General Branco also highlighted those partnerships C3P has begun to form with manufacturers, industry associations, universities, and testing and engineering centers of excellence throughout the European Union. Ms. Olga Dominguez, Assistant Administrator for the Office of Infrastructure and Administration at NASA, discussed the importance of agencies such as NASA being more efficient and reducing waste.

At the workshop, C3P and NASA also celebrated the 5-year anniversary signing of the *Joint Statement Between NASA and the Portuguese Ministry of Environment Regarding Cooperation in the Field of Environmental Pollution Prevention* in September 2002.

C3P is an international organization that facilitates partnerships with the scientific & technical community in Portugal, Europe, and the United States to identify and evaluate less hazardous and sustainable materials for use in acquisition, manufacturing and sustaining maintenance processes. The C3P is recognized by Ministério do Ambiente, Ordenamento do Território e Desenvolvimento Regional of Portugal (Portuguese Ministry of Environment), and NASA per the *Joint Statement Between NASA and the Portuguese Ministry of the Environment Regarding Cooperation in the Field of Environmental Pollution Prevention Matters*, signed on 18 September 2002.

The workshop was co-organized by the Escola Superior de Tecnologia do Mar and by Câmara Municipal de Peniche.

Summary Report for C3P & NASA Technical Workshop 2007

Peniche, Portugal
November 7, 8 & 9, 2007

Introduction

Since the year 2003, C3P has held an annual technical workshop for interchange and to help identify new project opportunities.

In November 2007, the C3P and the United States NASA hosted a technical workshop in Peniche, Portugal, with the support of Secretaria de Estado do Ambiente, and under the High Patronage of His Excellency the President of Portugal.

This report summarizes the activities and key outcomes of the three-day workshop.

Background

C3P is an international organization that facilitates partnerships between Portuguese, European and United States governments, industries and other governmental agencies for identifying and integrating pollution prevention (P2) solutions, practices and procedures that qualify less or non-hazardous materials used in acquisition, manufacturing and sustaining maintenance processes.

The C3P is recognized by the Portuguese Ministry of Environment, and NASA per the *Joint Statement Between NASA and the Portuguese Ministry of the Environment Regarding Cooperation in the Field of Environmental Pollution Prevention Matters*, signed on September 18, 2002.

C3P is a consortium of three elements: ITB, which provides engineering and technical support; ISQ, which supports the identification of pervasive needs and technologies across Portugal and Europe, as well as providing alternative material, technology identification and demonstration/validation testing; and INEGI, support study requirements for laboratory facilities, equipment and personnel.

The C3P was established to facilitate partnerships not only between NASA and Portuguese government agencies, but also between various Portuguese, American, and European Small and Medium Enterprises (SME). C3P fosters multi-participant cooperation to avoid duplication of effort, costs, and technical risk in reducing or eliminating hazardous materials at multi-program contractor sites and the various national host installations.

On a day-to-day basis, C3P supports program managers, defense contractors and industries from Portugal and Europe, and in particular, the SMEs, in addressing multi-participant problems in the uses of hazardous materials, waste generation and disposal. The concept operations of C3P define a systematic, phased methodology for identification and execution of C3P projects.

Overview of 2007 Workshop

The C3P & NASA Technical Workshop was held on 7, 8 & 9 November 2007 at Escola Superior de Tecnologia do Mar, in Peniche, Portugal, with the support of Secretaria de Estado do Ambiente, and under the High Patronage of His Excellency the President of Portugal.

The three-day workshop provided an excellent forum to up-to-date information on environmental and energy concerns that are common to Portuguese, European and U.S. Industries, as well as information on ongoing and future projects. Of particular emphasis, several technical sessions were devoted to the environmental and energy improvements planned for Berlenga Island.

In total, 243 individuals from eight countries (Portugal, USA, Netherlands, Spain, Finland, Italy, Poland and Germany) attended the technical workshop. More than 45 international scientists, technologists, and engineering experts presented PowerPoint slides. Feedback from the attendees indicated the workshop was a success and that they would attend again.

The technical workshop began with a general session given by distinguished speakers from C3P and NASA. Welcome Remarks were made by the President of the Escola Superior de Tecnologia do Mar, Prof. Júlio Coelho, and from the Mayor of Peniche, Dr. António José Correia. Welcome remarks were also made by Mr. Alfred Hoffman, U.S. Ambassador in Lisbon. A video with a statement from the Prof. Humberto Rosa, Secretary of State for the Environment was shown.

General (ret.) Pelagio Castelo Branco, C3P Director, welcomed all participants and guest-speakers and thanked Prof. Júlio Coelho for the use of their facility for the three-day workshop. Gen. Branco provided a brief overview of C3P and recalled some landmarks related to the intercontinental relationships over the past 5 years. Also highlighted was the need for C3P in Portugal and what partnerships C3P has begun to form with manufacturers, industry associations, universities, and testing and engineering centers of excellence throughout the European Union.

Next, Ms. Olga Dominguez, Assistant Administrator for the Office of Infrastructure and Administration at NASA, discussed the importance of agencies such as NASA being more efficient and reducing waste as a way of reducing mission risk and cost of operations. She noted how workshops such as this help NASA incorporate European Union requirements and directives into its risk planning. She also noted the importance of C3P, and notably the Berlenga Island project, in helping test new technologies in a real-world, harsh environment.

During the Opening Session, NASA and C3P celebrated the 5-year anniversary signing of the *Joint Statement Between NASA and the Portuguese Ministry of Environment Regarding Cooperation in the Field of Environmental Pollution Prevention* in September 2002. Plaques containing a small flag from Portugal flown aboard a Shuttle mission were displayed for later presentation to Portugal's President and the Minister and Environment.

The celebration of the 5-year anniversary was followed by the Keynote Address from Dr. Patrick Simpkins, Director of Engineering at NASA Kennedy Space Center. Dr. Simpkins discussed the past, present, and future of space exploration, noting the risks and rewards.

A presentation on the European Directive REACH (Registration, Evaluation, Authorization and Restriction of Chemicals), namely on the summary of status and implementation issues, was provided by Mrs. June Boldstridge from GAIA Corporation.

The afternoon presentations on the first day of the workshop provided an overview of the *Berlenga – Laboratório de Sustentabilidade* Project, as well as information on the environmental and energy plans for the Island. Other technical presentations from the Portuguese Agency for Environment (APA), NASA Regulatory Risk Analysis and Communication, SECIL and ISQ, were focused on the update of European and US restricted chemicals and advances in materials and conventional processes.

The second day of the technical workshop opened with a very comprehensive international overview of Green Chemistry, followed by a module of presentations on advances in materials and processes for lead-free soldering, focused namely on the LEADOUT Program results, overview and recommendations and training courses in lead-free soldering applied to SMEs. The afternoon presentations were focused on projects and advances in coatings, coating removal and surface cleaning processes.

Technical sessions on Renewable Energies occurred in parallel with the above-mentioned sessions on the 8th. The presentations were focused on micro-generation, wave energy, wind, and solar energy.

On the third day of the technical workshop, two parallel sessions occurred. One session was dedicated to the presentation of projects in the area of reduction of volatile organic compounds (VOC) and groundwater vulnerable zones and remediation processes and methodologies. The second session was dedicated to Renewable Energies (solar energy, hydrogen production and fuel cells) and to stewardship and best practices.

Workshop Outcomes

The workshop provided an excellent forum for information exchange among the international science and technology community in a broad range of technical areas of interest to academia, defense and commercial industries.

Throughout the workshop, the concept of collaboration and its inherent benefits was stressed.

Several desirable interactions occurred between presenters and attendees. Some examples include:

- Interactions between GE Global Research, EDP, and the Institute for Systems and Computer Engineering (INESC) Porto.
- Interaction between Applied Process Technology (developer of membrane technology) and the Instituto da Água (INAG) [Institute of Water].
- Interaction between ESA and NASA TEERM on lead-free electronics and chrome-free coatings.