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*Note: There is an Addendum to this publication
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RTO MEETING PROCEEDINGS 72

Strategies to Mitigate Obsolescence in Defense Systems Using Commercial Components

(Stratégies visant à atténuer l'obsolescence des systèmes par
l'emploi de composants du commerce)

*Copies of papers presented at the Systems Concepts and Integration Panel (SCI) Symposium held
in Budapest, Hungary, from 23-25 October 2000.*



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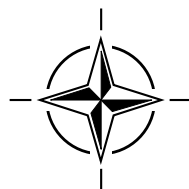
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- AVT Applied Vehicle Technology Panel
- HFM Human Factors and Medicine Panel
- IST Information Systems Technology Panel
- NMSG NATO Modelling and Simulation Group
- SAS Studies, Analysis and Simulation Panel
- SCI Systems Concepts and Integration Panel
- SET Sensors and Electronics Technology Panel

These bodies are made up of national representatives as well as generally recognised 'world class' scientists. They also provide a communication link to military users and other NATO bodies. RTO's scientific and technological work is carried out by Technical Teams, created for specific activities and with a specific duration. Such Technical Teams can organise workshops, symposia, field trials, lecture series and training courses. An important function of these Technical Teams is to ensure the continuity of the expert networks.

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Strategies to Mitigate Obsolescence in Defense Systems Using Commercial Components

(RTO MP-072 / SCI-084)

Executive Summary

With the rapid movement towards Commercial Off The Shelf (COTS) solutions within the US DoD procurement agencies and the simultaneous rapid consolidation of the US defense industrial base, obsolescence management and what has been referred to as Diminishing Manufacturing Sources and Material Shortages (DMSMS) is of great concern to both NATO governments and the defense/aerospace industry. Both governments and the defense industry face the dilemma of responding to requests for out-of-production items, primarily from within the semiconductor industry. The discontinuance rate of microelectronics parts has steadily increased. Many recent acquisition reform initiatives have shaken the foundation of the defense electronics industry and the associated government organizational cultures. Solutions to ease the way forward are needed.

The symposium outlined current problems of and solutions to the issue of obsolescence for the entire defense system community. It addressed questions related to the problem of parts obsolescence, diminishing manufacturing sources and material shortages. It also covered the actual status and experience in the application of COTS in defense electronic systems and reviewed associated benefits and drawbacks. Management tools and methodologies to cope with the risk of obsolescence were discussed. This included new design concepts and system architectures to allow advanced technology insertion during the system life cycle, thereby combating obsolescence. Papers were presented during the following sessions:

- Status and Experience with COTS Technology in Defense Electronics Systems
- Obsolescence Management and Tools
- New Design Concepts and Architectures to Combat Obsolescence
- Strategies and Initiatives for Life Cycle Management

Many excellent papers were presented at this symposium providing a good analysis of the problems of and recommendations on how to cope with obsolescence challenges in NATO defense systems. Unless the problem of obsolescence and diminishing manufacturing sources is widely accepted by governments, procurement or organisations and industries, our programs will be severely impacted. It is necessary to build partnerships to reduce diminishing manufacturing sources. We have to confront obsolescence in a proactive manner and plan new technology insertions. Solutions must be orderly, planned and budgeted for. What is needed is total weapon systems life cycle management. Only with this NATO will keep its systems current, operational and available.

Stratégies visant à atténuer l'obsolescence des systèmes par l'emploi de composants du commerce

(RTO MP-072 / SCI-084)

Synthèse

Suite à l'adoption rapide de produits du commerce (COTS) par la direction des approvisionnements du ministère de la défense US, qui s'est produite en même temps que la consolidation rapide de la base industrielle de défense US, la gestion de l'obsolescence, et ce qui a été appelée - Les sources de fabrication en diminution et les pénuries de matériaux (DSMS) - sont devenus un sujet de préoccupation majeur pour les gouvernements des pays membres de l'OTAN, ainsi que pour les industries de la défense/aérospatiales. Les gouvernements et les industries de la défense sont confrontés par le dilemme de savoir comment répondre à des demandes, émanant principalement de l'industrie des semiconducteurs, relatives à des éléments qui ne sont plus fabriqués. Le rythme d'interruption de fabrication dans l'industrie de la microélectronique s'est accéléré de façon continue. La réforme de l'approvisionnement a ébranlé jusque dans leurs fondements et l'industrie de l'électronique de défense et les structures gouvernementales dans ce secteur. Il est, par conséquent, indispensable de trouver des solutions permettant de définir la voie à suivre.

Le symposium a fait le point des problèmes actuels et des solutions envisagées pour résoudre la question de l'obsolescence par les spécialistes des systèmes de défense dans tous les pays membres de l'OTAN. La réunion a examiné des questions relatives aux problèmes de l'obsolescence des pièces, de la diminution des sources de fabrication et des pénuries de matériaux. Elle a évoqué la situation actuelle et l'expérience acquise en matière de mise en oeuvre de COTS dans les systèmes électroniques de défense et a fait allusion aux avantages et inconvénients y associés. Des outils et des méthodologies de gestion permettant de faire face à la menace de l'obsolescence ont été discutés. Les sujets discutés ont compris les nouveaux concepts et architectures de système permettant l'insertion de technologies avancées pendant le cycle de vie du système, pour combattre l'obsolescence. Les communications ont été présentées lors des sessions suivantes :

- Situation actuelle et expérience dans le domaine de la mise en oeuvre des technologies COTS dans les systèmes électroniques de défense
- Gestion de l'obsolescence et outils
- Nouvelles architectures et nouveaux concepts pour combattre l'obsolescence
- Stratégies et initiatives pour la gestion du cycle de vie

Le symposium a présenté des communications d'un très haut niveau, offrant une bonne analyse des problèmes rencontrés, ainsi que des recommandations concernant les moyens de faire face aux défis de l'obsolescence des systèmes de défense de l'OTAN. Si les problèmes de l'obsolescence et les sources de fabrication en diminution ne sont pas pris en compte par les gouvernements, les organisations d'approvisionnement et l'industrie, ils auront un impact considérable sur les programmes de défense. Il est nécessaire de construire des partenariats, afin d'endiguer la diminution des sources de fabrication. Nous devons faire face à l'obsolescence et prévoir l'insertion des nouvelles technologies. Il s'agit de la prévision méthodique et la budgétisation des solutions. Il faut mettre en place des systèmes de gestion du cycle de vie des systèmes d'armes. Seule cette mesure permettra à l'OTAN de disposer de systèmes de pointe totalement opérationnels.

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† Paper not available at time of printing.

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Theme

Commercial Of The Shelf (COTS) technology in military systems was initiated by the US Federal Acquisition Reform Act as early as 1994. While many military programs still require custom engineering, commercial of the shelf technology is clearly posed to dominate the future of defense electronic systems.

With the rapid movement towards COTS within the US DoD procurement and the simultaneous rapid consolidation of the US defense industrial base, obsolescence management or what is referred to as – Diminishing Manufacturing Sources and Material Shortages (DMSMS) – is of great concern to both NATO Governments and the Defense/Aerospace Industry. Government and defense industry face the dilemma of responding to out-of-production items, primarily from the semiconductor industry. The rate of microelectronics discontinuance has steadily increased. The acquisition reform has shaken the foundation of defense electronics industry and government organizational cultures. Solutions to ease the way forward are mandatory.

New strategies for obsolescence management including open architecture, functional partitioning and technology insertion have to be addressed during system engineering, detailed design, production and product support.

Thème

La mise en œuvre des technologies des composants du commerce (COTS) dans les systèmes militaires a été instaurée par la loi réformant les acquisitions fédérales US dès 1994. Si bon nombre des programmes militaires continuent de prévoir des ensembles fabriqués à la demande, les technologies des composants du commerce semblent être destinées à s'imposer pour la fabrication des futurs systèmes électroniques de défense.

Suite à l'adoption rapide de COTS par la direction des approvisionnements du ministère de la défense US, qui s'est produite en même temps que la consolidation rapide de la base industrielle de défense US, la gestion de l'obsolescence, communément appelée – réduction des sources de fabrication et pénuries de matériaux (DSMS) – est devenue un sujet de préoccupation majeur pour les gouvernements des pays membres de l'OTAN, ainsi que pour les industries de la défense et aérospatiales. Les gouvernements et les industries de la défense sont confrontés au dilemme de savoir comment répondre à des demandes, émanant principalement de l'industrie des semi-conducteurs, relatives à des éléments qui ne sont plus fabriqués. Le rythme d'interruption de fabrication dans l'industrie de la microélectronique s'est accéléré. La réforme de l'approvisionnement a ébranlé jusque dans leurs fondements et l'industrie de l'électronique de défense et les structures gouvernementales dans ce secteur. Il est, par conséquent, indispensable de trouver des solutions permettant de définir la voie à suivre.

De nouvelles stratégies de gestion de l'obsolescence, y compris l'architecture ouverte, le découpage fonctionnel et l'insertion des technologies, doivent être examinées lors des phases de l'ingénierie des systèmes, du projet détaillé, de la production et du support technique.

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14. Abstract <p>The meeting proceedings from this symposium on "Strategies to Mitigate Obsolescence in Defense Systems Using Commercial Components" was organized and sponsored by the Systems Concepts and Integration (SCI) Panel of the Research and Technology Organization of NATO in Budapest, Hungary from 23 to 25 October 2000.</p> <p>The symposium's goal was to propose new strategies for obsolescence management including open architecture, functional partitioning and technology insertion that have to be addressed during system engineering, detailed design, production and product support. The symposium outlined actual problems and solutions to the issue of obsolescence by the entire defense system community. It also addressed burning questions related to the problem of parts obsolescence and diminishing manufacturing sources and material shortages. Management tools and methodologies to cope with the risk of obsolescence were discussed. This included new design concepts and system architectures to allow advanced technology insertion during the system life cycle.</p> <p>Session topics were organized under the four topics of:</p> <ul style="list-style-type: none">- status and experience with COTS technology in defence electronic systems,- obsolescence management tools,- new design concepts and architectures to combat obsolescence,- strategies and initiatives for life cycle management.			

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