

# APAC Activities and Experience

APAC offers a wide range of services, which have been successfully applied in many industrial projects. Some of the services below are the result of studies, which may be found at the end of this list. Since 2006 APAC has supported ANSPs and competent authorities as a Qualified Entity (formerly Recognised Organisation) in accordance with Art. 3 Regulation (EC) No. 550/2004 as amended by Regulation (EC) No. 1070/2009. This status was awarded by the Austrian National Supervisory Authority, to support the NSAs in the assessment of compliance with the SES Common Requirements including safety.

## Activities

For some of the services listed below descriptions are available upon request:

- Project Management // PM //
- Safety and Security Management, Reliability Engineering // SAF //
- Quality Management // QM //
- Training Management // TRA //
- Configuration Management // CM //
- Test Management // V&V //
- EV - Earned Value (quantitative progress analysis) // PM //
- Project Status Audits // PM //
- BICO (**B**enchmarking and **I**SO 9001:2000 **C**ombined) // PICO (**P**rocess **I**mprovement **C**ombined // Approach) // CON // STUDY //
- Proposal (Tender) Management and Evaluation // TEN //
- Customer Satisfaction Surveys // QM //
- ISO 9001 Consultancy // QM //
- System Development and Deployment // DEV //
- Studies // STUDY //
- SES Regulations // SES //
- FAB Implementation Support // FAB //
- Security // SEC //

## Aerospace - ESA/ESTEC

### **SAFIS**

**// PM // SAF //**

APAC performed the project and technical management of the development of SAFIS; project team: ESTEC, Austrian Aerospace, Intecs, Austrian Aerospace, ERNO, IberEspacio.

APAC performed the project and technical management of the data collection and compilation for SAFIS; involved organisations: ESTEC, CNES, SAS, Delta, Intecs, Austrian Aerospace Company, ERNO, IberEspacio.

### **PSS-Update**

**// STUDY // CON //**

APAC performed studies on standards and provided the definitions of standards (PSS-series) for the aerospace business (European Space Agency, ESA); e.g. ESA PSS-Update (prime contractor: Intecs/Italy) which led to the update of the relevant ESA standards in the fields of Software Safety and Reliability.

## Industrial Projects

### Ukrainian State Air Traffic Services Enterprise (UkSATSE)

#### **Assistance to the Project Implementation Unit**

**// PM // TEN // SES // QM //**

The European Bank for Reconstruction and Development is in the process of providing a loan to the Air Navigation Service Provider of Ukraine (UkSATSE) in order to finance the time critical upgrading of hardware and software essential for efficient Air Traffic Management.

APAC was contracted to support the Project Implementation Unit (PIU) in the preparation of the tender documents and the provision of technical and operational support for the works, goods and services to be

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procured. This task also includes a review and amendments to the procurement plan, assistance in optimising the tendering strategy, preparing the tender documentation in compliance with the EBRD Procurement Policies and Rules, a review of the technical information for compliance with SES legislation and the ICAO/EUROCONTROL requirements.

APAC will support the organisation and management of the tendering process for the works, goods and services to be procured. The assignment also includes subsequent contract implementation and administration support. APAC will be responsible for the review of the interface between the various contracts, monitoring of and reporting on the progress/costs against the timetable and cost estimates including reporting to the EBRD and the review of UksATSE's risk management activities applicable to the procurement process.

## **Austro Control, HungaroControl and ANS CR**

### **FAB CE Project Management Service Office**

**// PM // SAF // QM //**

The Austrian, Hungarian and Czech Air Navigation Service Providers (ANSPs) commissioned the ATM consultancy APAC (with Helios as subcontractor) to support the management of the FAB CE initiative, which addressed the legal establishment, implementation and start of operations of a Functional Airspace Block in seven Central European countries: Austria, Bosnia & Herzegovina, Croatia, Czech Republic, Hungary, Slovakia and Slovenia.

The multi-national PSO team provided project management services to the FAB CE initiative. The team provided support for setting up FAB CE as well as for preparing the implementation of the FAB and its operational life. The support included the definition and setup of management systems in compliance with ISO 9001 and SES Regulations.

The team involved had extensive experience in consulting and managing projects for ANSPs, for national supervisory authorities (NSAs) as well as for other organisations involved in air traffic management, such as the European Commission and the military. It had worked extensively on previous assignments for FAB CE, including developing a cost-benefit analysis and a scheme for managing FAB performance, supporting FAB CE in the application for EU funds, managing the coordination with the TEN-T Executive Agency, setting up and implementing program cost controlling and progress reporting. The team consisted of international experts with many years of experience in ATM operations, technology, safety, performance, HR and program management.

## **MCAA (Civil Aviation Agency of the Republic of Macedonia)**

### **SES Compliance Project (ongoing)**

**// SES // SAF // QM // TRA //**

Establishment of SES compliant regulatory and organisational framework and to comply with the ECAA agreement, additionally already transposed SES regulations, national regulatory requirements, SES II regulations even if they are not fully applicable now and prepare for future evolution of SES regulations, not only in respect of the transposition but also related to the oversight and supervision which MCAA is required to perform under the regulations.

APAC was contracted by the Civil Aviation Authority (CAA) of the Republic of Macedonia to support the CAA in the supervision of ANSP M-NAV. In accordance with the transposed Reg. (EC) 550/2004 and Reg. (EC) 1315/2007, the CAA of the Republic of Macedonia delegated inspections and surveys referred to in Article 2(2) of 550/2004. The delegation includes inspections and surveys necessary for the certification of M-NAV's new ATM system-based operational service according to Article 7 of Reg. (EC) 550/2004.

## **Civil Aviation Agency of the Czech Republic**

### **Elaboration of IFR Study**

**// SES // SAF //**

The Civil Aviation Agency of the Czech Republic commissioned APAC to elaborate an IFR study. Subject of the contract was the elaboration of a study on the general principles for the redistribution of the Czech airspace in a way allowing IFR arrivals/departures to/from uncontrolled aerodromes and ensuring a sufficient safety level of air traffic. A feasibility study, CONOPS and safety assessments were the main outcomes of this study.

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## EASA (European Aviation Safety Agency)

### **EASA.2015.HVP.12 Impact Assessment & Evaluation of EASA rules in the field of Aviation Safety (ASSESS II) - ongoing**

**// SES // SAF //**

EASA awarded a framework contract for “Impact Assessment & Evaluation of EASA rules in the field of Aviation Safety” to the consortium of ALG – APAC – SENASA. The consortium will support EASA with experts having specific expertise to contribute to or fully perform preliminary regulatory impact assessments, regulatory impact assessments, and ex-post evaluations in the field of aviation safety, including analyses of any aspect within the EASA’s aviation safety remit.

### **Regulatory Impact Assessment (RIA) to support the RMT.0679 – Revision of Surveillance Performance and Interoperability (project under Framework contract: EASA.2015.HVP.12 (ASSESS II)) - ongoing**

**// SES // SAF //**

The consortium of ALG – APAC – SENASA will support EASA with experts establishing a reliable, traceable and structured model to propose an optimum surveillance deployment in the EASA Member States area. Afterwards, a standard economic model will be developed to measure the impact of the new surveillance infrastructure in areas previously not provided with such coverage. Finally, the consortium experts will develop a comprehensive scale allowing for a comparison of the economic impacts of the different RIA options in financial terms versus the turnover/budget of a specific stakeholder.

## Sensometrix

### **Assessment and Improvement of Sensometrix Process Maturity and Conformity with Standards**

**// QM // SAF //**

APAC has been contracted by Sensometrix to perform an external audit as a starting point for their activities for the improvement of engineering processes. The objectives of this audit were to provide information for the implementation of software supply chain management; the preparation for the most common SW&HW certifications, and the support in the “To go to market strategy decision” by the implementation of efficient and low-risk processes.

Following the assessment of Sensometrix’s development process and conformity with standards, APAC has been contracted to provide process improvement support, comprising the review of the relevant documentation, and support in the implementation of required changes.

## Topex

### **Assessment of conformity with ED-153 and SW development process upgrade support**

**// QM // TRA // SAF //**

Topex develops voice communication systems (VCS) for ATM. The customers of the European Union require conformity with EC Reg. 482/2008. The most commonly used means of compliance with this regulation is ED-153.

APAC made a high-level presentation of the requirements to be met and of its experience in supporting companies in establishing a SW development quality and safety system to achieve the required conformity. APAC performed an assessment based on ED-153 and supports Topex for the implementation of the identified improvement areas and the compliance with EC Reg. 482/2008.

## IQSoft

### **Training and implementation support for software safety and ED-153 compliance**

**// QM // TRA // SAF //**

APAC has performed a training about the implementation of ED-153 and assessment as well as implementation consultancy.

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## **BAF (GERMAN National Supervisory Authority)**

### **Audit of DWD (German MET Provider)**

**// SES //**

APAC has been contracted by the NSA to assess the German MET Provider for compliancy with the applicable Common Requirements and to make a recommendation for certification.

### **Assessment of Black Forest Airport Lahr**

**// SES //**

APAC was contracted by the NSA to assess the Black Forest Airport Lahr Air Navigation Service Provider for compliance with the applicable Common Requirements and to make a recommendation for certification.

### **Training in EC regulatory procedures as SES implementation support**

**// SES // TRA //**

APAC was contracted to develop a training providing an introduction to the European rulemaking process. The objective of the training was to explain the European institutions involved as well as the process of drafting and commenting on regulations.

### **Training of NSA inspectors for assessment of service providers for compliance with applicable EC Regulations and local legislation**

**// SES // TRA //**

APAC was contracted to provide training for safety inspectors to prepare them for their tasks in accordance with the SES regulations. As part of this task an Inspectors' Handbook/Manual was developed.

## **KZPS (Kontrola zračnega prometa Slovenije) - Slovenia Air Traffic Control**

### **Technical Programme Management for Migration to new ATCC**

**// PM // QM // CM // TENDER // V&V //**

Slovenia Control renewed the existing ATM system and moved to a new ACC location at the airport in Brnik. The migration was performed in several steps and, simultaneously, a substantial system upgrade was performed. The worn-out trackers, FDPS, HMI and VCS were replaced. To reduce the risk it was planned to install and integrate the new systems already at the old location and deploy the new system at the new location. APAC was contracted for the technical migration programme management for the migration to the new location. The programme management responsibility included guiding and managing the technical project managers, moderating the steering groups, preparing and reviewing the calls for tender, initiating and controlling the activities and, last but not least, managing the project office.

### **Safety Assessment for new ATCC**

**// SAF //**

Slovenia Control relocated the ATCC close to the Brnik airport. During this relocation several systems were replaced, including ASD/RDD, FDPS and SDPS. APAC was contracted to perform the safety management for the complete technical relocation of the ATCC to the new location. This task included the support of the system suppliers for ESARR 4/6-compliant software safety management, review of the suppliers' safety deliverables and the creation of the ATM system safety case as a basis for the certification by the National Supervisory Authority.

### **Definition and Implementation of a Safety Management System**

**// SAF //**

APAC was contracted by Slovenia Control to develop a safety management manual describing the related processes compliant with the requirements defined by the EC Regulation 2096/2005 (Common Requirements). APAC also provided support for the implementation of these processes.

## **DFS Projects (Deutsche Flugsicherung GmbH) - German Air Traffic Control**

### **ANDRA**

**// QM // CM // TENDER //**

APAC was responsible for the quality management and the configuration management in the ANDRA project (Advanced Node for Data Relay in the ATN). In addition, APAC has defined the project-specific standard for the evaluation of the tenders and has supported DFS in the assessment of the suppliers' process capabilities. The ANDRA project improves reliability and performance of the air traffic control data transfer system by means of implementing state-of-the-art technology. APAC's tasks also include supporting and fine-tuning of the requirements in the management process.

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## **Integrated Tower System**

**// QM // PM //**

APAC was responsible for the quality management and for the support of the project management by the implementation of project management tools in the project ITS (Integrated Tower System). The main project goals were to build a new system that is scaleable and adaptable to all 17 towers in Germany and to reduce the "system diversity" of the "DFS Platzkontrollstelle". The newly developed or adapted software components for the air traffic control operations should use the same HMI software. By adhering to CORBA, DFS aims to allow for the development and deployment of distributed object systems in heterogeneous environments.

## **SVS-D Tower for the part addressing status & conformity audits**

**// QM // PM //**

SVS-D Tower is an Air Traffic Communication System designed to be used in several towers in Germany. APAC's consulting services for this project included support during the project initialisation phase. Additionally, we monitored the status of the project on a regular basis by calculating the earned value of the project and by performing status audits during which the progress of the project and conformity with the project plans were verified.

## **Safety and Security Analysis as well as Tracing of the Implementation in the ANDRA Project**

**// SAF //**

The ANDRA system requirements were analysed as specified in the DFS internal standard "Sicherheitsanforderungen an flugsicherungstechnische Systeme", "IT-Sicherheitshandbuch, BSI 7105" and taking into account other state-of-the-art standards. On the basis of the results of this analysis, the IT-Safety and Security Concept for the development and operation of the ANDRA system, which complies with the internal DFS standards and the BSI 7105 (applicable for the selection and implementation of security measures), was developed.

APAC reviews the suppliers' products and traces the safety and IT security-related activities during the implementation and deployment of ANDRA.

## **VAN 2. Release**

**// QM //**

APAC supported this project by putting its knowledge in quality management for projects into practice. The project VAN 2 Release had a duration of two years and ensured that the system is able to operate properly beyond the year 2000. Additionally, the system performance and switching performance was improved by the implementation of new hardware and a new database concept.

## **Update Project Management Handbook**

**// PM // CON //**

The tasks of defining the topics of project reporting and project structuring have been assigned to APAC. These inputs were used for the DFS-wide "Project Management Handbook".

## **SIA**

**// QM //**

The major task of the former IA department was the management of the on-site installation of air traffic equipment in towers. The goal was to provide the users with turnkey solutions. APAC was assigned to oversee the quality management at several sites.

## **SIP**

**// CON // CM //**

The former SIP Department was responsible for making sure that the air traffic management products to be installed at DFS towers meet the requirements of the users. This included the management of the implementation of the necessary updates. APAC was assigned to analyse the processes and to support the definition of the configuration management processes.

## **IDPS (Information Data Processing System)**

**// QM // PM //**

The main goal of the project was to install the IDPS system according to its operational and technical requirements (the IDPS is a sub-system of the DFS-ITS tower system for which the requirements are maintained in the DFS-ITS requirements data base). The DFS intends to procure an IDP system which can be integrated in an ITS system.

In this project APAC has been assigned the task of supporting the project management with regular progress reports and Quality Management activities.

# APAC Activities and Experience

## **TFDPS (Tower Flight Data Processing System)**

**// PM // QM // CM //**

The goal of the project was the gradual implementation of an ITS TFDPS component and the related ACC/APP-Tower-Interface for the future P1-Environment based on an NDI product. APAC supported the project, quality and configuration management processes within the DFS project team.

## **Audit of the HMI Pathfinding**

**// QM // CON //**

The DFS contracted APAC for auditing a sub-project of the project VAFORIT (Very Advanced Flight Data Processing Operational Requirements Implementation). The results have triggered organisational and process improvement measures.

## **ARTE (Automatic Radardata Transmission Equipment)**

**// QM // CM //**

APAC has been assigned to oversee the quality management and to support the project and configuration management activities in the project ARTE. The project took about four years. The ARTE system provides an alternative source of radar data within 5 seconds in case of a node failure.

## **Audit of the Branch Telecommunication and ATC Center for ISO 9001:2000 Conformance**

**// QM //**

APAC performed an on-site audit to identify the necessary improvement measure to meet the ISO 9001:2000 requirements. The scope also included operational maintenance of ATC equipment. The report formed the basis of the improvement measures to be implemented for the ISO 9001:2000 certification.

## **Quality Management Documentation and Audit Support of the F&E Department**

**// QM //**

APAC reviewed the quality management documentation of the F&E department for consistency, completeness and compliance with ISO9000. In addition, APAC performed the internal audits for all processes and their implementation as preparation for the external certification audit.

## **RMCDE Audit and Risk Evaluation**

**// CON // QM //**

RMCDE (Radar Message Conversion and Distribution Equipment) provides critical information for the operation of air traffic control. It was APAC's mission to evaluate the implemented processes and the documentation to provide recommendations for higher reliability and availability of service. The supplier and Eurocontrol were also visited during the evaluation. APAC was supported by the DFS quality assurance department.

## **Support of the Telecommunication Unit and the Central Services for ISO 9001:2000 Compliance**

**// CON // QM //**

APAC supported this unit of DFS during the implementation of a process oriented Quality Management System conforming with ISO 9001:2000. APAC created and reviewed process descriptions and quality system related documents. APAC also moderated quality-related workshops.

## **Support of the Tower and Center Unit for ISO 9001:2000 Conformance**

**// CON // QM //**

APAC has been assigned to support these two DFS units during the implementation of a process oriented Quality Management System conforming with ISO 9001:2000. APAC created and reviewed process descriptions and quality system related documents. APAC also moderated quality related workshops.

## **MUBANET (Multiplexer Basic Network)**

**// QM // CM //**

APAC has been assigned to oversee the quality management and to support project and configuration management activities in the project MUBANET. The project had a duration of about three years. During the project the multiplexer systems were procured and integrated in the telecommunication infrastructure of the DFS.

## **Configuration and Change Management Process Audit of Tower Leipzig and Hannover**

**// CON // QM //**

APAC performed on-site audits to identify non-conformances with standards by the defined configuration and change management process. The audits covered all systems and the entire infrastructure available in the Tower.

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## **CMMC-FM (Common Maintenance Monitoring and Control – Facility Management)**

**// QM // CM //**

APAC was assigned to oversee the quality and configuration management and to support the project management activities in the project CMMC-FM. The project duration will be about four years. The project goals are the provision and indication of status information of the facility management systems as well as the development and realisation of a Service Management Centre for central monitoring of the relevant facility management systems of all operationally used DFS objects (CC, Tower, CNS).

## **DFS Energy (new building of the power station Langen)**

**// PM // QM // CM //**

APAC supported DFS Energy in setting up the planning process and in defining the PM, QM and CM processes for all involved project partners. The realisation of the new building was scheduled to take place in 2014.

## **TGM Cluster Mitte Start-up Phase**

**// PM // QM // CM //**

APAC supported the DFS Technical Facility Management in setting up, defining, implementing and monitoring the PM, QM and CM processes for the Start-up Phase of the new service provider for the Cluster Mitte.

## **Austrocontrol (ACG) - Austrian Air Traffic Control**

### **Quality Gate for FAB CE TEN-T Preparatory Phase**

**// QM // FAB //**

The FAB CE project received funding from the EUROPEAN COMMISSION via the TEN-T Agency. Austrocontrol was the leader of this project and contracted APAC to act as quality gate vis-à-vis the TEN-T Executive Agency.

### **Drafting of Application for the FAB CE TEN-T Implementation Phase**

**// PM // FAB //**

The FAB CE initiative partners apply for funding from the EUROPEAN COMMISSION via the TEN-T Agency. Austrocontrol was the coordinator of this project and contracted APAC to draft the application for funding for this phase.

### **NG-AATMS Safety Assessment (COOPANS FHA and PSSA)**

**// SAF //**

APAC was contracted to perform an FHA and PSSA of the ATS services to be provided by the new NG-AATMS (COOPANS) system as a basis for safety-related product specification.

### **Improvement of the Tender Process**

**// TEN // CON //**

A method for the evaluation of tenders has been defined. Tenders have been evaluated according to these methods.

### **AUSTRAS - ACC Simulator auditing & PM**

**// PM // QM // CM //**

Initially APAC was assigned the task of auditing, of carrying out quality management and configuration management and of supporting the subcontractor management for the extension of the existing simulator system. Later on APAC also took over responsibility for the project management.

### **SAFMAN**

**// SAF // CON //**

APAC was assigned a leading role in the definition and implementation of effective and efficient organisation, methods and processes for safety management at ACG in accordance with the EATCHIP Safety Policy. APAC's activities included the creation of the safety manual that included all ACG safety management issues (organisation, training, procedures, auditing).

### **CAPS (CEATS AMS PROVIDER SUPPORT)**

**// QM //**

APAC was responsible for the quality check of each deliverable before it had been forwarded to ACG for delivery to EUROCONTROL.

# APAC Activities and Experience

## EUROCONTROL

### **Network Manager Top 5 Safety Risks Review**

**// PM // SAF //**

The scope of this contract included the collection and analysis of safety information, population of aviation accident barrier models with the collected information, consolidated analysis of the emerging Top 5 safety priorities, maintenance of the data analysis infrastructure, including analysis and proposals to update the aviation accident barrier models and general project support for the years 2015-2017.

### **EATMP- CEEC (Central and Eastern European Cooperation) – EATMP Framework**

**// PM //**

APAC was the consortium leader of CEEC (Central and Eastern European Cooperation) - a consortium that successfully submitted a successful bid for the EATMP Framework.

Nine companies in four countries founded a consortium to offer SW development, safety, operational and management services in the ATM environment.

### **EEC-CEEC (Central and Eastern European Cooperation) - EATMP Framework**

**// PM //**

APAC was the consortium leader of CEEC (Central and Eastern European Cooperation) - a consortium that submitted a successful bid for the CEE Framework.

Eleven companies in six countries founded a consortium to offer research expertise for Sector Safety and Productivity, Network Capacity and Demand Management, Airport Throughput, Innovative Research and Society-Environment-Economics in the ATM environment.

### **Evaluation of the EATM Safety Assessment Methodology as a means of compliance with ESARR 4**

**// SAF // STUDY //**

EATM Safety Assessment Methodology is a harmonised set of working practices for Air Navigation Service Providers to assess the safety of the proposed changes to their systems.

APAC has been contracted to evaluate the EATM Safety Assessment Methodology as a means of compliance with ESARR 4.

### **Evaluation whether the DFS Risk Assessment Methodology is a means of compliance with ESARR 4**

**// SAF // STUDY //**

APAC was contracted by EUROCONTROL to assess whether the DFS Risk Assessment Methodology is a means of compliance for a part (or all) of the requirements contained in ESARR 4, RISK ASSESSMENT AND MITIGATION IN ATM.

### **SESI – EUROCONTROL support for the creation of Guidance Material for NSA and ANSP**

**// SES // STUDY //**

EUROCONTROL established the “SES Implementation Support” (SESI) project, whose scope was to assist National Supervisory Authorities (NSAs) and Air Navigation Services Providers (ANSPs) in the context of certification. Accordingly, EUROCONTROL developed guidance material for NSAs to certify ANSPs against the Common Requirements (CRs), and for ANSPs to comply with the CRs and be certified.

APAC has been contracted to support EUROCONTROL in the creation of the guidance material.

### **SESI – EUROCONTROL support for the creation of Guidance Material on Common Requirements Compliance on Quality**

**// SES // QM // STUDY //**

EUROCONTROL established the “SES Implementation Support” (SESI) project, whose scope was to assist National Supervisory Authorities (NSAs) and Air Navigation Services Providers (ANSPs) in the context of certification. Accordingly, EUROCONTROL developed guidance material for NSAs to certify ANSPs against the Common Requirements (CRs), and for ANSPs to comply with the CRs and be certified.

APAC has been contracted to support EUROCONTROL in the creation of the guidance material to fulfil the Common Requirements on Quality, for example, the development of guidance material and supporting documentation on ISO 9001:2000 certification.

### **SESFARR – EUROCONTROL support for the Factual Review & Reporting on the SES Implementation Progress**

**// SES // STUDY //**

APAC supported EUROCONTROL in the development of the questionnaire that addresses States, NSAs as well as ANSPs and aims at obtaining a factual review of the implementation status of the SES Regulations, using the results as a basis to create a report for the European Commission.



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## **Development of SeRT Course 6 Requirements “Detailed ESARR 3 Training”**

**// SAF // STUDY //**

APAC was contracted to develop requirements for a training programme that will enable the delegates to describe the SMS concept in depth as well as to design an ESARR 3 Implementation Plan to enforce ESARR 3 within the national safety regulatory framework and, finally, to regulate against a national rule based on ESARR 3 (including the verification of compliance with ESARR 3 requirements).

## **ASSIST Level 1 Support – Knowledge Management Database for SES Guidance Material**

**// STUDY //**

APAC was contracted to develop a Knowledge Management Database for related SES Material (e.g. SESIS Guidance Material) by EUROCONTROL. The aim of this project was to increase the usability of the available material.

## **ECRA - EUROCONTROL Documents Restructuring ARTAS**

**// STUDY //**

ARTAS is a very important safety critical surveillance data processing system widely used in ATS. EUROCONTROL contracted a team to upgrade the ARTAS product to meet at least the SWAL 4 (recommended minimum requirement for operational ATM system) to the highest possible extent. APAC's role in the consortium is, among others, to assess the current system, identify the gaps and to verify the correct upgrade of the system.

## **Development of ESARR 3 GUI for interpretation of ESARR 3**

**// STUDY //**

The EUROCONTROL Safety Regulatory Commission developed Safety Regulatory Requirements (ESARR 1 to ESARR 6). To support the harmonised implementation of the ESARRs, several standards such as Acceptable Means of Compliance (AMCs) as well as Guidance Material were developed. APAC was contracted to develop an ESARR 3 Guidance Document addressing monitoring and verification of implementation of ANSP resources and Critical Incident Stress Management (CISM), ICAO material on SMS, including inputs from workshops and SRC deliverables in local languages and Safety Oversight of safety training, incident reporting and human factor elements.

## **Comparative Analysis of the Irish and Austrian CAAs and ANSPs**

**// SES // STUDY //**

APAC was contracted by EUROCONTROL to perform a comparative analysis of the management systems in Austria, Ireland and the theoretical civil aviation system to support Cyprus focusing on best practice and conformance with SES Regulations and ISO 9001 with regard to the selection and implementation support for an appropriate model for the civil aviation organisation.

## **CIMACT**

**// SAF // STUDY //**

The purpose of CIMACT is to integrate civil and military air traffic data to provide the user with a comprehensive overview of the air situation. It provides information on all basic ATC functionalities and safety nets and uses a variety of supplied data inputs. APAC was contracted for the safety assessment as well as the analysis to identify the gaps of the existing system with regard to the required SWAL level identified during the safety assessment as well as the compliance with ISO/IEC 12207.

## **LARA**

**// SAF // STUDY //**

LARA is a EUROCONTROL airspace booking management system for civil/military coordination. APAC was contracted to carry out the preliminary safety assessment of LARA to be reusable with modifications as minimal as possible for the ANSP's safety cases, as well as the safety assessment of a specific implementation at an ANSP.

## **ESARR 5 Implementation Course**

**// SAF // STUDY //**

APAC was contracted by EUROCONTROL's Institute of Air Navigation Services (IANS) to develop the ESARR 5 training course, mainly for ESARR 5 national focal points, safety regulators working in connection with ESARR 5 (licensing staff, competency assessment staff for engineers and technical personnel, safety oversight).

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## **SES Training Course for NSA (Regulatory Framework Training)**

**// SAF // SES // STUDY //**

APAC was contracted by the Safety Regulatory Unit and EUROCONTROL's Institute of Air Navigation Services (IANS) to develop the SES training course. This training course was dedicated to National Supervisory Authorities to support them in gaining the required competence to meet their requirements. The training course will provide an introduction to the Single European Sky and will form the basis for further training.

## **Regulatory Support Material for Safety Oversight Workshops for NSA**

**// SAF // STUDY //**

APAC was contracted by the Safety Regulatory Unit to support the implementation of ESARR 1 and the Commission Regulations 1315/2007. This training programme was designed as a series of workshops that will be dedicated to certain topics and will, on the one hand, provide the theoretical basis, and on the other hand, guidance for the practical implementation.

## **Development of Checklists and Questionnaires for NSA Peer Reviews**

**// SES // FAB //**

APAC was contracted to develop standardised checklists and high-level questionnaires for the Peer Reviews to be performed in accordance with the principles established in Article 9 of Commission Regulation (EC) No. 2096/2005. The aim of the documents and material developed by APAC was to support the NSAs in performing the peer reviews, a process based on a "teach and learn" approach aimed at improving the NSAs' arrangements through the exchange of lessons learnt and good practices. The peer review involves the NSAs under review and a dedicated team (the Peer Review Team) composed of experts from other NSAs and a facilitator.

## **Conducting and Analysing the SKYbrary User Survey**

**// SAF // STUDY //**

APAC was contracted with the development, conducting and result analysis of a survey among the international users of the SKYbrary platform. The SKYbrary repository provides free safety information products to its user community (aviation stakeholders worldwide) and is managed and maintained by EUROCONTROL. The 'SKYbrary user survey' project analysed the existing SKYbrary community and identified next steps to be taken in the platform's development. An expert in knowledge management was closely involved in the project. The survey was carried out online involving more than 650 respondents worldwide, and was followed up by detailed interviews of a representative sample of survey respondents. The APAC team analysed the survey results and released final reports containing a detailed analysis, strategic recommendations and a roadmap for future actions to be implemented in order to achieve the development goals of the SKYbrary knowledge platform.

## **Development of explanatory & support material for SESIS/AEGIS (Explanatory Material for Recognised Organisations and Notified Bodies)**

**// SES // STUDY //**

Development of guidance material to provide guidance to the Member State and/or its National Supervisory Authority on the provisions relating to the issuing of a recognition to a specific organisation (to become a "Recognised Organisation") and the appointment of a Notified Body.

## **EAD Consortium Frequentis**

### **EAD (European Aeronautical Information Services Database)**

**// PM // QM // CM // TRA // TEN // V&V //  
SAF // CON // DEV //**

APAC performed project, quality, training, test and configuration management in the EAD Programme, for an overview please go to: <http://www.eurocontrol.int/ead/> or <http://www.apac.at/TeamEAD/>. APAC took over the management responsibility for EAD and performed a project re-initialisation.

As part of the Programme Management, APAC set up a management system in compliance with ISO 9001 and SES Regulations for the newly created organisational unit for EAD.

Under APAC's management, EAD was developed in less than three years in accordance with the planning at the project re-initialisation. It has now been operational since 2003-06-06.

APAC was also in charge of safety management and provided security consulting services to the supplier. In order to do this efficiently, a joint safety and security team APAC/EUROCONTROL was formed.

This team developed a combined safety and security approach providing an efficient and effective implementation of applicable safety and security requirements.

# APAC Activities and Experience

APAC took also over the EAD client migration management and was contracted to manage the Pilot and Alpha Client Integration into EAD, which included co-ordination with Eurocontrol, about 15 ANSPs, GroupEAD, CSC Copenhagen, the EAD System Supplier and the production of SLAs, specification and development of Client specific SW as well as managing the Client's integration at the IT site. Management of the implementation of the EAD safety and security requirements at the Clients was also a major task of this project.

## **Frequentis GmbH**

### **Development of Safety and Quality Specific Procedures**

**// CON // SAF //**

Frequentis produces state-of-the-art, dependable products for air traffic control services. APAC has developed company-specific procedures and standards to meet the safety and quality requirements of the projects (in accordance with the MIL-Standards and DoD-Standards).

### **Definition of SW-Engineering Standards**

**// CON // V&V // DEV //**

APAC was assigned by Frequentis to support the development of company-specific SW engineering standards that offer the benefit of improving the process and product quality. The standards and procedures include configuration management procedures, verification and validation procedures and software engineering standards.

### **Development of a Global Resource and Project Control Model**

**// CON // PM //**

With the help of APAC's consulting services a sound and widely accepted Global Resource Control and Project Control Model was developed and implemented. The model includes:

- project standardisation and planning
- company-wide project monitoring
- company-wide planning and controlling of human resources
- a project metrics programme

The developed procedures are implemented with the support of SAP R3 (Accounting and Management Information System).

### **SVS-D**

**// PM // QM // DEV //**

SVS-D is an Air Traffic Communication System ordered by Deutsche Flugsicherung and implemented by a consortium including Frequentis GmbH and Siemens AG. APAC performed the overall planning tasks and status audits on the SVS-D project to verify the progress and to assure conformity with the project plan. In addition, APAC was contracted to manage the process of the finalisation of the documentation and to write technical documents.

### **SW Development Cost Estimation**

**// PM // QM // DEV //**

The application of different software cost estimation methods (3-D Function Point Method, COCOMO and Vollmann Method) used in FREQUENTIS projects was analysed. The goal of the project was the definition and implementation of a company-specific Cost Estimation Model.

### **TETRA**

**// PM // V&V // QM //**

APAC has been responsible for central and independent co-ordination in the joint development of TETRA of SIMOCO (England) and FREQUENTIS. The activities included the co-ordination of the joint planning, the tracing of progress, risk management and monitoring of development and test activities.

### **ACC**

**// PM // QM // DEV //**

Within this project APAC applied its knowledge of Project Management and Quality Management to the development, installation and transition of a new voice communication system for AUSTROCONTROL (Austrian Air Traffic Authority) as responsible project manager.

### **Customer Satisfaction Survey**

**// QM //**

APAC was assigned the task of performing the annual customer satisfaction evaluation for 1997 by Frequentis. Additionally, the customer satisfaction with Frequentis projects was continuously re-evaluated by APAC until 1999.

# APAC Activities and Experience

## **BICO Audit/Project Status Audit**

**// PM // QM //**

APAC performed BICO Audits and Project Status Audits on a regular basis (about 35 audits during the last four years). This includes audits of subcontractors and potential subcontractors.

## **ISO 9001:2000 Consultancy**

**// QM // CON //**

APAC was assigned the task of supporting the implementation of a quality management system in FREQUENTIS Bratislava, which was already successfully certified according to the ISO 9001:2000 standard. APAC has also supported the preparation of the external certification audit according to ISO 9001:2000 at FREQUENTIS Offenbach, which was also successfully passed in the form of an audit.

## **Support during the Tender Process**

**// TEN //**

The process-specific part of the tender NB3 and Terraфон was partly compiled and verified with the support of APAC.

## **Monthly Progress Reports**

**// PM //**

APAC was tracing the progress of several projects and provided the management with monthly progress reports.

## **Evaluation of Companies – Audits**

**// QM // CON //**

APAC was assigned the task of evaluating the processes at several suppliers or co-operation partner companies and to support the improvement of the joint processes.

## **Safety and RAM (Reliability, Availability, Maintainability) Support**

**// SAF //**

APAC was continuously assigned the task of conducting the safety and RAM processes in many projects. The overall objective of a system safety programme is the reduction of potential system risks by providing a comprehensive assessment of the system's ability to maintain service to its users in the event of hardware and/or software failures.

It was the goal of the RAM Programme and its activities to assure the design of an inherently safe and effective system.

## **DORIS (Danube River Information Service)**

**// PM // QM //**

The concept of this information system for inland navigation follows two major goals: The provision of the actual traffic (tactical traffic image) as the nautical component and the online provision of a widespread information system of all facts of the operative inland navigation with respect to the logistics component. APAC was in charge of supporting the project management with regular project status audits of the suppliers and during the overall project planning and progress tracking.

## **Metropolitan Police**

**// PM // QM //**

Frequentis was in charge of providing a Video and Voice Communication System to the Metropolitan Police in London. APAC was continuously assigned to perform project status audits of the suppliers and also to support the overall project planning and progress tracking.

## **EAD IT Service Provision Setup**

**// DEV // CON //**

On behalf of the GroupEAD Europe S.L. shareholder FREQUENTIS, APAC was primarily responsible for managing and performing the setup of the EAD Service Provision. This consisted of the development/implementation of the IT related services and procedures, which were described in the related service plans, EAD client planning and client integration related procedures and covered the initial EAD data load. The project was completed ahead of time and the EAD Service Provision could therefore be started two months earlier than scheduled. For more information on EAD, please go to <http://www.eurocontrol.int/ead> or <http://www.apac.at/TeamEAD>.

## **Offer Management Support**

**// TEN //**

APAC was contracted to support the offer department in the preparation of three VCS tenders. APAC was responsible for the whole tender process until the tenders were submitted.

# APAC Activities and Experience

## **Project Management NAV CANADA**

**// PM // QM //**

APAC performed project, quality and configuration management in the NAV CANADA Project. This project consisted of the data migration to the EAD System as well as the creation of new charts and publications. In addition, the implementation of the eAIP was part of the project.

## **GWDI SW development process assessment**

**// SAF // CON //**

APAC performed an assessment for Frequentis of the GWDI SW development processes for conformity with EC Reg. 482/2008 and ED-153.

## **Integration Management TWR Zeltweg**

**// PM //**

APAC was assigned to perform the integration management in the TWR LOXZ Project incl. Set-Up, implementation and monitoring of the Management Processes and system interfaces, creation and implementation of the Integration and Migration plan for the Communication and Information system from several international suppliers. The project goal was the integration of the information and communication systems in the new tower Zeltweg to ensure air traffic at this military airport.

## **EAD (European Aeronautical Information Services Database) phase 2**

**// PM //**

APAC was in charge of the EAD (European Aeronautical Information Services Database) phase 2 Development and ITP Service Provision Programme Management including coordination of EAD/SESAR activities.

## **smartAIM Projects**

**// PM //**

APAC was assigned to the Management of the FREQUENTIS smartAIM Projects department and Project Manager of the NAVC Canada Maintenance and AISS Philippines projects.

## **Frequentis Group certification as Czech ATM system provider and NOTAM/AFTN system certification**

**// SES //**

APAC was supporting Frequentis to prepare the required information and to receive the certification as Czech ATM system provider and NOTAM/AFT system certification according to the SES and Czech legislation. APAC was responsible for the co-ordination of the activities with the Czech NSA.

## **ANS CR, Austrocontrol, Slovenia Control**

### **One Air Traffic Management System (OATMS)**

**// PM // QM // CM // SAF //**

The One ATM System joint undertaking was a technical and commercial initiative to renew the Czech, Slovenian and Austrian Air Navigation Service Providers' current ATM systems in phases between 2007 and 2012. In its efforts, it aims to maximise the benefits for the stakeholders, especially for the airspace users, by minimising life-cycle costs for the system and the services, by following the Single European Sky principles and by striving to achieve the targets of harmonisation and integration.

APAC was in charge of the management of the One ATM System EWIV (EEIG), including project, quality and configuration management. In this context, APAC set up a management system in compliance with ISO 9001/SES Regulations for the legal entity One ATM System EWIV (EEIG).

## **Skysoft ATM**

### **Assessment of the Development Process**

**// DEV // QM // SAF //**

APAC was contracted by Skysoft ATM to assess the development process for product development for conformance with EN61508 SIL2 and to support the process improvement.

## **SASKI**

**// DEV // QM // SAF //**

SkySoft has to perform a Software Safety Assessment for some of its solutions currently in operation within skyguide. APAC was contracted to support SkySoft with the implementation of Safety Assessment (FHA, PSSA and SSA activities) procedures compliant with ESARR 6 by a reference implementation for "SkyVisu". The activities include the training sessions to convey ESARR 4/6/SAM theoretical knowledge as well as the moderation of safety assessment activities.

# APAC Activities and Experience

## Belgocontrol

### **ASD Product and Development Process Assessment**

**// PM // QM // SAF //**

As part of the Belgocontrol CANAC Upgrade project the Advanced Situation Display (ASD) was developed by an external supplier.

APAC was assigned the task of evaluating the product and processes for maintainability and compliance with requirements derived from ESARR 4 and to propose adequate improvement measures.

### **AMS Product and Development Process Assessment**

**// PM // QM // SAF //**

AMS provides A-SMGCS functionality at the Brussels Tower. APAC was contracted by Belgocontrol to assess the associated business, operational, safety and development processes to support the decision concerning future strategies in this area. Part of this activity was the assessment of compliancy with SES safety requirements.

## Other ATM

### **Irish Aviation Authority (IAA) Assessment**

**// V&V // SAF //**

APAC performed an assessment of the IAA processes for compliance with ED-153 and assessed the verification and validation related to the local production of a COOPANS build and acceptance testing for operational use for effectiveness and efficiency.

### **COOPANS Consortium/Thales Audit**

**// V&V // SAF //**

APAC was contracted by the COOPANS Consortium to assess the Thales development processes and artefacts for compliance with the SWAL 3 requirements of ED-153 and additional focus on Thales internal SW verification and validation.

### **Assessment of MET product development processes**

**// V&V // SAF // TRA //**

APAC performed an ex-post assessment of Scintec's MET product development processes for compliance with the SWAL 4 requirements of ED-153 and supported Scintec for the upgrade of the product development processes to make it compliant with the respective requirements.

### **Implementation of SES compliant processes for airports**

**// SES // SAF //**

Due to SES regulations all ANSPs (Air Navigation Service Providers) needed to fulfil the requirements defined in the EC Regulation 2096/2005 (Common Requirements). APAC supported airports such as the airport Finkenwerder (Airbus/Hamburg) in preparing for certification.

### **Implementation of SES and ISO 9001 compliant processes for the Mannheim Airport**

**// QM // SES // SAF //**

APAC supported the regional Mannheim airport in preparing for ISO 9001 and SES certification, which they achieved as planned.

### **Training for the implementation of ESARR 3 compliant Safety Management Systems**

**// SES // SAF //**

The EC Regulation 2096/2005 (Common Requirements) as well as ESARR 3 require ANSPs (Air Navigation Service Providers) to implement and maintain a safety management system. Based on the extensive experience in this area APAC developed a hands-on training course to support ANSPs (Air Navigation Service Providers) that need to implement and maintain a safety management system.

## TeleControl

### **IV&V**

**// V&V //**

TeleControl assigned APAC as an Independent Verification and Validation Company to develop system test plans for main modules of the UNIBET lottery system, and to support the TeleControl internal test team with independent V and V activities.

# APAC Activities and Experience

An additional benefit as a result of our activities in this project was the specification of a universal test database where test cases, test objects and the results of the performed tests are filed and processed for further evaluation.

## **BICO Audit**

**// QM //**

APAC performed a BICO Audit on a sample project to identify areas with potential for improvement.

## **ORS - Austrian Aerospace Company**

### **CIPIS**

**// DEV // PM //**

Project and Technical Management of the development of CIPIS (Computer Integrated Project Information System) with special emphasis on the requirements of ESA/ESTEC for planning, accounting and reporting. A system for managing project data of many large projects (planning, effort, costs, results) running at different organisations and sites was implemented including data exchange interfaces for remote sites. Project Partners were ORS/Austria and IberEspacio/Spain.

### **ZSK400**

**// DEV //**

Development of a Windows-based interface with the hardware and database of the time-keeping system ISGUS. ZSK400 was integrated in CIPIS. The aim of ZSK400 was to provide the user with information about his daily working hours, which are then assigned to projects and automatically compiled at the end of each month.

## **Improx**

### **ISO 9001:2000 Consultancy and Project Management Support**

**// QM // CON //**

APAC was assigned the task of supporting the implementation of a quality management system, which was successfully certified according to ISO 9001:2000. On the basis of its experience in successful project management, APAC also supported the implementation of a goal-driven project management model.

## **Security in Aviation/ATM**

### **Research Executive Agency (REA)**

#### **Expert Evaluator for the 2011 Security Research Call by the REA**

**// SEC //**

APAC's General Manager Susanne Lanzerstorfer was selected by the REA for the role of an independent Expert Evaluator of proposals for EU funding submitted in relation to the field of aviation security research. She was assigned the task of supporting the evaluation of research proposals in relation to the 2011 Security Research Call within the framework of the EU Financial Perspective 7 (FP7).

### **Austrian National Supervisory Authority (NSA)**

#### **Austrian NSA delegate to the EUROCONTROL ATM Security Team (SET)**

**// SEC //**

APAC was assigned the task of representing the Austrian NSA within the framework of EUROCONTROL's ATM Security Team (SET). APAC was tasked with establishing and maintaining a working contact between EUROCONTROL and the Austrian NSA in the field of security in ATM, based on APAC's extensive experience in ATM.

# APAC Activities and Experience

## Studies/Products

### **BICO**

**// STUDY // QM //**

Development and application of BICO (Benchmarking and ISO 9001:2000 Combined). BICO is a life-cycle model which combines the ISO 9001:2000 requirements with quantitative assessment methods as a sound tool that supports the customer on the way to effective and efficient quality management.

BICO activities include the participation in a European training programme that is supported by the Commission of the European Communities under the LEONARDO DA VINCI Programme.

### **Project Status Audit / BICO**

**// STUDY // PM // QM //**

On the basis of the BICO tools APAC developed a procedure for the very efficient and effective determination of the status of a project. The data collected during an audit allows a comparison of actual progress to planned progress. The resulting audit report identifies the project risks and determines the progress of the project in a quantitative way. The procedure has already been successfully applied in the air traffic systems environment (e.g. Frequentis, Siemens, DFS).

### **Project Management Model**

**// STUDY // PM // QM //**

Based on its experience in successful project management, APAC developed a goal-driven project management model that minimises risks and increases productivity. Accurate project tracking based on the Earned Value Method allows the timely identification of potential problem areas and the initiation of corrective actions. APAC was assigned the task of implementing this model in a software development company. It was part of the contract to adapt the model to company-specific needs, training and the management of several projects during implementation.

### **ISVV (Independent Software Verification and Validation)**

**// STUDY // V&V //**

A study on the verification, validation and evaluation of software projects by external, independent companies was conducted. This study was funded partly by the Austrian Authorities (FFF) and supervised by ESA/ESTEC.

### **IX (Independent X-Model)**

**// STUDY // V&V // QM //**

On the basis of a study under the supervision of ESA/ESTEC, APAC developed a process model for IV&V (Independent verification and validation in accordance with the APAC IX-model) that can be tailored to the needs of the customer.

### **ApoMet**

**// STUDY // V&V // QM //**

Development of an effective metric set for small and medium-sized companies.

### **SWE**

**// STUDY // DEV // QM //**

Verification of the hypothesis "Software Engineering Pays". The study consists of an experimental study and of research based on existing data and literature. In the experimental study, six teams developed a programme starting out with the same specification but with different requirements for the development process. The results show the influence of appropriate software engineering methods on the quality, the schedule, the development effort and the maintenance effort of a software product.

### **PICO (Process Improvement Combined Approach)**

**// STUDY // DEV // PM // QM //**

The mission of PICO was to develop a set of tutorials dealing with the different improvement approaches which can be combined to become an overall model to transfer state-of-the-art improvement knowledge. The project was funded partly by the Commission of the European Communities under the LEONARDO DA VINCI Programme. APAC was the prime contractor and was responsible for the project management and quality management of the multinational project.

### **APLET**

**// STUDY // DEV // PM // QM // CM //**

APAC developed a solution based on MS-Exchange to support Project Management, Quality Management and Configuration Management.



# APAC Activities and Experience

## **PICO Toolset Project Management**

**// STUDY // DEV // PM // QM //**

Multi-platform data collection SW tool for safety and quality auditing in a distributed environment with a central database to store data of different organisations with the option that data can be compared without disclosing their origin. Remote access via internet or dial-up as well as a graphical visualisation of the results were also implemented. Several interfaces to import data from other tools were implemented. APAC was the prime contractor, and partners involved in the development of the tool were ISCN/Ireland, aimware/Ireland, ami/France. The SW was developed and distributed among the partners and integrated/tested at APAC.

## **ASMM - APAC Safety Management Model**

**// STUDY // SAF // CON //**

At the end of 2004, APAC launched an internal project with the aims:

- to develop a methodology for safety audits in cooperation with Corvinus University Budapest (ASMM project); and
- to develop material for common requirement audits and to obtain the authorisation to call itself a "recognised organisation" as defined in the Common Requirements for the Provision of Air Navigation Services.

This methodology for safety audits will include the development of a safety maturity model.

