

# The UniKL MIAT Strategy in Implementing JAR Part 147 Approved Aviation Training Organization

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## Abstract

Aviation schools worldwide must comply with the industry requirements in order for their students to have a high rate of employability. Thus any universities or institutions offering studies in aviation or aircraft technology must fulfill the industry requirements. The aviation industry worldwide is regulated by regulatory bodies such as JAA (Joint Aviation Authority) or EASA (European Aviation Safety Agency). The paper will look at UniKL MIAT strategy in offering aviation training that fulfilled the aviation industry requirements. The strategy includes getting international recognition on the training offered, by developing the curriculum based on the Joint Aviation Requirement (JAR), setting up of the Quality System to monitor the implementation of the training, and offering professional examination to the graduating students. With the internationally recognized licence, the graduates will have wider access to the aviation industry worldwide, thus securing them for a global job market.

*Keywords: Aviation, JAA, MRO, Aircraft Maintenance*

## 1. Introduction

The uniqueness of aviation lies in its stringent regulatory requirements which govern every conduct of aviation activities in the world. All activities from the selection of materials for aircraft manufacturing to the operation of an aircraft to the training of aviation personnel all must follow the requirements set up by the International Civil Aviation Organization (ICAO), the highest governing body in the field of aviation.

At UniKL MIAT our aim is to produce graduates with internationally acceptable level of knowledge and competency. Therefore the need to obtain JAR Part 147 Training Organization approval from the JAA (Joint Aviation Authority) or (EASA) European Aviation Safety Agency is vital. By virtue of holding the approval means that, students, apart from training, can be assessed or examined by UniKL MIAT itself instead of going through the authority examination processes because this task is now delegated to UniKL MIAT. Such an exclusive privilege will only be realized only if UniKL MIAT is capable of meeting the standards required as an aviation training provider acceptable to the authority.

## 2. Aircraft Maintenance, Repair, Overhaul (MRO) Industry

The commercial aircraft Maintenance, Repair and Overhaul (MRO) is evolving rapidly in this region due to the strong market demand from passengers and cargo traffic, the emerging low cost carrier (LCC) and the increasing trend of operators to outsource maintenance works. In addition, many commercial operators' fleets are starting to age, which means deeper levels of maintenance and longer time for repair.

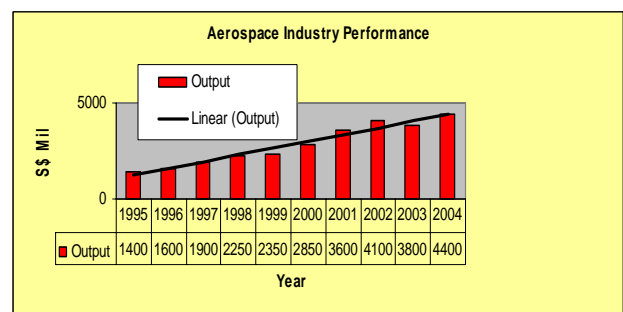


Figure 1: Example of industry growth for MRO business in Singapore for 1995-2004 [1]

Aerospace industry growth largely

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through MRO activities which make up 90% of the industry's total output. The MRO sector contributes ~ 4% to the global MRO market and 20% to the Asian MRO market [1]. MRO is offering a full range of services, including airframe maintenance, engine overhaul, engine component repair, structural systems repair and avionics systems repair. In Malaysia, the projected manpower by 2010 will see among 20,000 'skilled' aviation engineers and technologists are required.

### 3. Civil Aviation Regulatory Framework

#### 3.1 The Joint Aviation Authorities (JAA)

The Joint Aviation Authorities (JAA) is an associated body of the European Civil Aviation Conference (ECAC) representing the civil aviation regulatory authorities of a number of European States who have agreed to co-operate in developing and implementing common safety regulatory standards and procedures. This co-operation is intended to provide high and consistent standards of safety and a "level playing-field" for competition in Europe. The JAA Membership is based on signing the "JAA Arrangements" document originally signed by the then current Member States in Cyprus in 1990 [2].

#### 3.2 Department of Civil Aviation Malaysia (DCA)

The conduct of civil aviation in Malaysia falls under the jurisdiction of the Ministry of Transport. The Ministry of transport has delegated its powers to the Department of Civil Aviation (DCA) The DCA administers national aviation safety and regulatory programme. It is primarily a government regulatory authority. Regulatory enforcement is via legislative means to ensure that aviation activities are conducted in accordance with the regulation. On training regulations, Malaysian Civil Airworthiness Regulations (MCAR) states, pursuant to Regulation 31 (6) ( c ) of Civil Aviation Regulation (CAR) 1996. This regulation is further amplified in Airworthiness Notices (AN) 85 which detail all the requirements pertaining to the approval of organizations in Malaysia [3].

Where does the DCA come into the picture for Part 147 approval as pursued by UniKL MIAT? No, the local DCA involvement for the implementation of EASA Part 147 will not be necessary. Currently, the DCA does not adopt JAR 147.

### 4. Requirements for Aviation Organization

#### 4.1 Part 145

JAR-145 prescribed the requirements for the organization seeking approval to carry out maintenance of the aircraft or aircraft components intended for fitment to such an aircraft.

#### 4.2 Part 66

JAR-66 prescribed the requirements for the qualification of those personnel authorized by a JAR-145 approved maintenance organization to issue Certificates of Release to Service (CRS).

#### 4.3 Part 147

JAR-147 prescribed the requirements to be met by organizations seeking approval to conduct approved training/responsibility examination of certifying staff as specified in JAR-66.

### 5. Requirements Interface

JAR-66 represents the harmonisation of requirements within the Joint Aviation Authorities for the qualification of personnel involved in the certification of maintenance. These require an individual to hold a JAR-66 licence which is rated for certain basic categories or sub-categories of aircraft and type ratings as appropriate to the activity and aircraft type concerned. Holders of the appropriate licences are then eligible to be issued with a certification authorisation under the approval of a JAR-145 approved maintenance organisation. This allows the authorised individual to issue a Certificate of Release to Service for maintenance which has been carried out [4].

As part of the requirements to be satisfied prior to licence issue JAR-66 requires that the applicant demonstrates an adequate knowledge of the theoretical subjects associated with the licence sought and produces evidence of having met certain minimum periods of practical maintenance experience. The training must be conducted by a suitably approved JAR-147 maintenance training organisation who will provide not only the theoretical instruction required but also teach the individual the basic hand-skills and maintenance practices. Basic training consists of an approved course of training which is then followed by a period of practical experience prior to licence issue. This can be regarded as consolidation experience intended to ensure that the licence holder has a reasonable degree of exposure to aircraft maintenance and fault diagnosis and rectification prior to licence issue.

## 6. Aviation Training Philosophy

The concept of approved aviation training is straightforward. The course content itself is defined in JAR-66 Appendix 1 and the expected minimum training hours in JAR-147. However the organization is expected to prepare a detailed analysis of the conversion of the JAR-66 knowledge requirements into training packages, either as complete or subdivided modules of training, to match the required training periods. Account should be taken of the different levels of knowledge and their application to the relevant course categories or sub-categories.

The organisation will also be required to provide the student with a programme of practical experience which gives an understanding of basic hand-skills and the use of tools, an awareness of maintenance practices and basic assembly and disassembly techniques and familiarisation with the actual process of maintenance and the associated control procedures and documents.

An approved organisation is expected to train its students. The process should not be seen as one where the student is taught only what he needs to know to pass the organisation's examinations. The JAR member states acknowledge the benefits and improvement in maintenance standards which should result from formal training of the agreed syllabus leading to a high underpinning competence. The licence issued at the end of the process will entitle the holder to work anywhere around the world where it is recognised. Organisations approved in accordance with JAR-147 are therefore expected to show and exercise an appropriate degree of professionalism and integrity in their management and delivery of training.

## 7. Privileges of JAR-147

As an approved EASA Part 147 Training Organization UniKL MIAT is granted with privileges to carry out the following as permitted by and in accordance with the maintenance training organisation exposition [5]:

- Basic training courses to the Part-66 syllabus.
- Aircraft type/task training courses in accordance with Part-66.
- The examinations on behalf of the competent authority, including the examination of students who did not attend the basic or aircraft type

training course at the maintenance training organisation.

- The issue of certificates following successful completion of the approved basic or type training courses and examination as required.

## 8. Meeting the Requirements of JAR-147

### 8.1 Courses Offered

UniKL MIAT has set up a Curriculum Development Team (CDT) that will look into the requirements of the specified syllabus per JAR 66. JAR-147 specifies the minimum course length and the proportion of theoretical to practical experience appropriate for the particular licence. The CDT is expected to prepare an analysis of how it expects to deliver the course based upon the available time and the knowledge requirements or syllabus in JAR-66 in a semester system. The syllabus content varies in both scope and depth according to the licence to which the course is intended to lead. In essence the team is expected to perform a training needs analysis for each course.

As per the requirement, the course length for Category B1 or B2 is listed in JAR-147 as a minimum of 2400 hours. This is to be conducted within the three years duration. Although the industry has debated the mode of instruction which was traditionally conducted in modular system, this has somewhat softened as UniKL MIAT is firm of the rationale behind the migration. It has to be remembered that the courses offered are academically and practically viable where requirements of JAR-66 are 100 percent complied with no reduction in the experience requirements.

A course of JAR-147 approved training will consist of the theoretical training, the practical hand-skills element and the industry experience required for licence issue. To gain experience will require students to be attached with the industry for duration of 6 months. A student may only be considered to have completed the approved course when he or she has satisfied all the elements of the approved course to the required standards of examination or assessment.

Students are supplied with mandatory textbooks and are supported by appropriate lecture notes. These should be comprehensive enough to provide key elements of the subject, typical examples and installations and the associated maintenance practices, which are normally extracted from Aircraft Maintenance Manual (AMM).

References to further reading material are also supplied such as Civil Aircraft Information Procedures (CAIP).

## 8.2 Organization

Being a new aviation training provider in Malaysia with historical background initially started up as IKM, then becoming an institute until the establishment of a university charter, UniKL MIAT has grown up to maturity. Throughout the development UniKL MIAT is not only capable of delivering necessary theoretical aspects of the training but also capable of executing practical training required by JAR-147. Although UniKL MIAT is currently lacking of “live aircraft” but by seeking alliances or by contracting out the On-Job-Training (OJT) this element can easily meet any shortfall against the requirements. However, under the 2010 roadmap by UniKL MIAT this deficiency will be eliminated when the new Subang campus is ready to be occupied in 2007/08.

UniKL MIAT will be headed by an Accountable Manager who will be a senior manager with full executive and budgetary powers to ensure that the needs of the organisation in respect of the requirements are met. The organisational structure of UniKL MIAT is headed by several Sections in place for Training Manager to support the day to day management of the training programme and to ensure that the JAR-147 requirements are met. The Quality Section is set up to manage certain elements with a degree of independence. These include in particular examination preparation and delivery and a Quality auditing function.

## 8.3 Exposition & Procedures

As parts of the requirement of JAR-147 UniKL MIAT is expected to have a quality system in place for both the management of the training and the quality audit function to ensure compliance with the requirements. A key issue is therefore the preparation of procedures to support the organisation’s activities. The topics to be covered are numerous but reflect the working practices used within UniKL MIAT. The Standard Operating Procedures (SOP) are also under development with cross reference documents and to be made available for auditing purposes.

## 8.4 Facilities and Equipment

The facilities available at UniKL MIAT is second to none when considering the purpose of its establishment. This means classrooms for theoretical instruction, workshops for basic hand-skills tuition and hangars or simulated maintenance environments are complete to provide the

exposure to basic maintenance practices. The workshops and hangars are supported by samples of aircraft equipment and components appropriate to the courses being undertaken including complete aircraft for familiarisation purposes. Samples of “real life” components or equipment may not be an issue since the equipment are reasonably up to date and representative of current technologies. Furthermore, the students will be exposed to the latest technology during their industry attachment.

The classrooms are equipped with presentation media appropriate to the method of delivery with minimum overhead projection equipment. All lecturers are equipped with lap tops to facilitate the classroom teaching. The use of Computer Aided Training (CAT) or Computer Based Training (CBT) as part of the training mechanism is also available.

## 8.5 Workshops

The practical workshops is designed to provide exposure to a working or realistic simulated maintenance environment by following a structured programme of tasks involving the use of maintenance manuals, adherence to company procedures and to provide some degree of familiarity with aircraft systems, operational checks and maintenance activities.

All workshops in UniKL MIAT have provision for demonstrating and for students to practice the normal use of hand tools generally used in aircraft maintenance. This will include basic engineering activities such as filing, drilling, reaming etc., for all students. UniKL MIAT has also develop a practical programme of training to complement the theoretical training and meet the objectives of the practical element of the approved course. This will cover certain tasks by way of tuition and then practical exercises which are assessed since the necessary skill assessment forms part of the course requirements.

A selection of representative aircraft components and items are used for demonstration purposes and the acquisition of skills in disassembly and re assembly techniques and familiarisation with good maintenance practice. At UniKL MIAT all components and equipments are fully representative of operational aircraft systems and are fully utilized to allow students’ assessment of the relevant skills.

## 8.6 Lecturers/Instructors

This is the most important elements that UniKL MIAT is looking into at current stage – suitably qualified

lecturers/instructors. This is difficult considering the nature of aviation field development in Malaysia. Unlike western countries where aviation is considerably matured however in this countries it is not so. So lots of learning curve is expected while meeting the requirements of JAR-147 is equally important.

Lecturers/instructors employed by UniKL MIAT to deliver the courses will need to be proven competent to do so. Generally speaking, there are no aviation specific instructor qualifications available at this time. Learning at UniKL MIAT is continuous. In the absence of any formal qualification UniKL MIAT will provide training in instructional techniques, on job training by observation and participation and assessment before being considered competent.

Many instructors currently at UniKL MIAT are ex-service instructional personnel. Whilst the value of such persons cannot be discounted it is essential that they are given exposure to civil maintenance practices and access to current aircraft types and technologies in order that they can deal adequately with the subject matter to be taught. They are encouraged to go for the licensing examination at the DCA. Those young lecturers are encouraged to pursue Masters Degree with period of attachments with the industry to observe maintenance tasks and gain an understanding of the maintenance and procedural systems in use.

### 8.7 Examinations

As an approved JAR-147 training organization, UniKL MIAT is expected to carry out examinations of the various modules of theoretical knowledge and the associated practical assessments for those courses for which it is approved. The examinations will be as specified in the JAA Administrative and Guidance Material Chapter 23). This means that the main examination mode is by multi-choice questions with a few essay style questions drawn from certain modules.

UniKL MIAT will have to nominate examiners who will prepare a database from which question papers can be drawn or alternatively raise a number of question papers for examination purposes. It is important that the questions are kept secure in order that the examinations represent a fair attempt at assessing the knowledge of the student. Since UniKL MIAT is still lacking in this area this is compensated through consultancy or collaborations with established training organizations worldwide. Examinations must be prepared and conducted in an appropriate manner with due consideration to the need for confidentiality

Practical assessments are required for various elements of the course as well. UniKL MIAT has Memorandum of Understanding (MoU) with several key players in the industry and currently working on a package which will determine the acceptability of OJT's log book etc. These could include disassembly and re-assembly tasks along with wirelocking and torque loading, etc.

## 9. Conclusion

As an approved JAR-147 aviation training institution, UniKL MIAT is now able to produce graduates of internationally recognized qualification. This means that the graduates are now globally marketable with wider access to the world job market. The strategy will also position UniKL MIAT on international map for aviation training provider in the region.

## References

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## Biographical information

Mr. MOHD KHIR HARUN, worked for Malaysia Airlines for 11 years, 6 years as a Licenced Aircraft Engineer working on Boeing 737 and 777 aircraft and the remaining as a Quality Assurance Inspector. Prior to joining Universiti Kuala Lumpur, he worked for the Boeing JV company in aircraft composites manufacturing as a Quality Specialist. He holds Masters of Science in Systems Engineering & Management. He is a Member of The Royal Aeronautical Society, UK, Institute of Quality Malaysia and a registered Incorporated Engineer (IEng) with UK Engineering Council. Presently works as an Associate Professor at UniKL MIAT.

Ir AHMAD JAIS ALIAS started his career as an Engineer with Sony Video (M) Sdn. Bhd. for 4 years, an experience which qualifies him to attain the Professional Engineer title. Then he joined Universiti Kebangsaan Malaysia as lecturer for ten years, before recently moved to Universiti Kuala Lumpur. UniKL is known for its industrial-based fields of study, and he is now sharing his experience to train the future aviation industry workforces.