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Airport Pavement Design and Valuation: Introduction of Boeing 777 and Airbus A-380

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1.0 INTRODUCTION

The local and regional aviation industry is currently undergoing rapid expansion in line with improving economic and tourism activities within our country and also the Asia Pacific region. However, the aviation industry is also a very competitive industry, which requires large capital investment, and airline companies are constantly trying to improve their efficiencies in order to remain profitable. The importance of improving efficiencies is made even more important in view of the current high oil prices.

Therefore, the recent introduction of the super-sized aircraft, Airbus A-380 is indeed welcomed by the local and also international aviation industry. The introduction of Airbus A-380 with its standard seating capacity of 555 people is expected to lower operating cost per kilometre by 15% to 20% per seat compared to Boeing 747. The lower operating cost together with the increasing difficulties in getting additional landing/frequency slots at major airports have led to the decision by our Malaysia Airlines (MAS) to purchase 6 units of the A-380 which is expected to commence operation by 2007.

The introduction of the super-sized aircraft presents new and unique challenges to the civil engineering profession. For example, the aircraft with its unprecedented span of 79.750m, length of 72.727m (Figure 1) and weight of 562,000kg would require facilities such as hangar to be designed with very large span and the pavement designed to support the heavy weight of the aircraft. In addition, the aircraft also uses a different landing gear configuration as compared to existing aircrafts, which will affect the method in which engineers design airport pavement.

Figure 1: General airplane dimensions A380-800/800F models (from Airbus, 2004)

Therefore, this article intends to highlight some aspects of design and evaluation of pavement to accommodate the new generation of aircrafts, i.e. Airbus A-380 and Boeing 777 in accordance with the requirements of International Civil Aviation Organisation (ICAO) and U.S. Department of Transportation, Federal Aviation Administration (FAA).

2.0 CHARACTERISTICS OF AIRBUS A-380 AND BOEING 777

Traditionally, design and evaluation of airport pavement is based on semi-empirical methods where the pavement structural thickness required is based on theoretical analysis coupled with results of full-scale tests on in-service pavements. One of the most important criteria in the formulation of existing design methods is the gear and wheel arrangement.

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Figure 2: Design charts for flexible pavements for B747 (from FAA, 2004)

Previous design methods made certain assumptions with regards to the gear and wheel arrangement in producing design charts such as those given by FAA for single wheel gear, dual wheel gear, dual tandem gear and also specific charts for wide body aircraft such as A-300, B747, etc. Examples of design charts given by FAA for the design of flexible and rigid pavements for B747 are shown in Figures 2 and 3 respectively.

However, gear and wheel arrangement for Airbus A-380 and Boeing 777 with its triple dual tandem (TDT) main gear are significantly different as compared to existing aircraft. The TDT main gear is unique as it has six wheels arranged as three pairs of wheels in a row. Figure 4 shows the arrangement of the double dual tandem main gear of Boeing 747-400 while Figure 5 shows the main gear arrangement for Airbus A-380.

In addition, the existing design charts only cater for a limited range of aircraft weights. The limited range of aircraft weights, different gear arrangement and coupled with the fact that the existing design charts involve some degree of empiricism renders the existing design charts not applicable for the design of pavement for Airbus A-380 and Boeing 777.

3.0 DESIGN OF AIRPORT PAVEMENT

There are many design methods for rigid pavement which are widely used such as the methods published by the International Civil Aviation Organisation (ICAO), US FAA, the Property Services Agency (PSA) Airfields Branch (UK), BAA plc, Transport Canada, Mincad Systems, Australia and Societe Techniques des Bases Aeriennes (STBA) France (Barling & Grimsdale, 2000). Design methods developed by FAA are based on the California Bearing Ratio (CBR) method for flexible pavements and the Westergaard analysis of edge loaded slabs for rigid pavement. Both methods incorporate some degree of empiricism especially the CBR method which is derived from results of field instrumentation on in-service pavements. Therefore, due to the limited applicability of the empirical methods for the design of airport pavements for Airbus A-380 and Boeing 777, a new theoretical method is necessary.

The **Layered Elastic Design Theory** developed originally by the U.S. Army Corps of Engineers, Waterways Experiment Station is recommended by the FAA to calculate design thicknesses for airfield pavements to address the impact of new gear and wheel arrangements such as the TDT main gear (Advisory Circular AC No: 150/5320-6D). This design method is computationally intense and a computer program called LEDFAA is available to assist in the design. LEDFAA can be downloaded from FAA's website (http://www.faa.gov). The user interface of the program LEDFAA is shown in Figure 6.

LEDFAA was developed and calibrated in order to produce pavement thickness designs consistent with previous methods based on a mixture of different aircraft rather than individual aircraft. Determination of a design aircraft is not

Figure 4: Double dual tandem gear arrangements of Boeing 747-400 (from Boeing, 2002)

Figure 3: Design charts for rigid pavements for B747 (from FAA, 2004)

Figure 5: Triple dual tandem gear arrangements of Airbus A-380 (from Airbus, 2004)

Figure 6: LEDFAA Program

required in LEDFAA as compared to previous methods as the program calculates the damaging effects of each aircraft in the traffic mix. The design conditions are satisfied when the cumulative damage factor (CDF) sums a value of 1.0.

The required inputs for LEDFAA are as follows:

a) Design life of pavement;
b) Traffic mix;
c) Aircrafts load;
d) Pavement components;
e) Subgrade parameters;
f) Flexural strength of concrete (for rigid pavement).

3.1 Design life of pavement

The FAA design standard for pavements is based on a 20-year design life.

3.2 Traffic mix

As mentioned in the paragraph earlier, traffic mixture need not be converted into a single design aircraft and all annual departures converted to equivalent annual departures of the design aircraft. In LEDFAA, the traffic mix for all the aircrafts expected to use the pavement are keyed-in into the program. The program analyses the damage to the pavement section for each aircraft and determines a final thickness for the total cumulative damage.

3.3 Aircrafts load

Generally, pavements should be designed for the maximum anticipated take-off weight of the aircraft. However, other weights of aircraft for specific areas of the pavement where the aircraft loads are known can be considered during design. The following is a brief definition of some of the aircraft loadings terminology:

a) Maximum Design Ramp Weight (MRW)
This is the maximum weight for ground manoeuvre (including weight of taxi and run-up fuel) as limited by aircraft strength and airworthiness requirements. It is also called Maximum Design Taxi Weight (MTW).

b) Maximum Design Landing Weight (MLW)
This is the maximum weight for landing as limited by aircraft strength and airworthiness requirements.

c) Maximum Design Takeoff Weight (MTOW)
This is the maximum weight for takeoff as limited by aircraft strength and airworthiness requirements. (This is the maximum weight at start of the take-off run).

d) Maximum Design Zero Fuel Weight (MZFW)
This is the maximum permissible weight of the aircraft less usable fuel.

e) Operating Weight Empty (OWE)
This is the weight of structure, powerplant, furnishings, systems, and other items of equipment that are integral part of a particular aircraft configuration plus the operator's items. The operator's items are the flight and cabin crew and their baggage, unusable fuel, engine oil, emergency equipment, toilet chemical and fluids, galley structure, catering equipment, seats, documents, etc.

3.4 Pavement components

The designer is required to select the appropriate pavement components based on factors such as availability, ease of construction and cost. In addition, the minimum thickness of each layer must also be satisfied in order to obtain satisfactory design. The pavement components are as follows:

a) Flexible pavement

i) Hot mix asphalt surfacing
Minimum thickness of 5 inches (127mm) is required for traffic mixes that include aircraft with the TDT gear.

ii) Base course
Minimum thickness of 6 inches (150mm) is required for pavements serving aircraft with the TDT gear.

iii) Subbase
Minimum thickness of subbase for structural purposes is 3 inches (76mm).

b) Rigid pavement

i) Concrete pavement
Minimum concrete surfacing thickness is 6 inches (152mm).

ii) Subbase
Minimum thickness of subbase is 4 inches (102mm).

It should be noted that FAA requires a stabilised base and subbase courses for flexible pavement and stabilised subbase

Table 1: Field CBR and subgrade modulus based on soil classification-unified classification system (from FAA, 2004)

Major Divisions		Group Symbols	CBR	*k value (pci)*
Coarse-grained soils	Gravel and gravelly soils	GW	60-80	300 or more
		GP	35-60	300 or more
		GU	25-50	300 or more
		GM	40-80	300 or more
		GC	20-40	200-300
	Sand and sandy soils	SW	20-40	200-300
		SP	15-25	200-300
		SU	10-20	200-300
		SM	20-40	200-300
		SC	10-20	200-300
Fine-grained soils	Low compressibility LL<50	ML	5-15	100-200
		CL	5-15	100-200
		OL	4-8	100-200
	High compressibility	MH	4-8	100-200
		CH	3-5	50-100
		OH	3-5	50-100

courses for all rigid pavements designed to accommodate aircraft weighing 100,000 pounds (45,400 kg) or more.

3.5 Subgrade parameters

Subgrade parameters required for the design of pavement is the California Bearing Ratio (CBR) for flexible pavement and the modulus of subgrade reaction (k) for rigid pavement. The CBR and k value can be determined from field tests in accordance to ASTM D 4429, Standard Test Method for Bearing Ratio of Soils in Place and AASHTO T222, Nonrepetitive Static Plate Load Test of Soils and Flexible Pavement Components for Use in Evaluation and Design of Airport and Highway Pavements respectively. Laboratory tests and correlations can also be used for preliminary design if field values are not available. Table 1 shows some typical values of CBR and subgrade modulus for preliminary design purposes.

The National Cooperative Highway Research Program, USA has published preliminary correlations of CBR values with soil index properties for use in AASHTO's 2002 Design Guide (ARA, 2001). Generally, the subgrade is divided into two groups:

a) Coarse materials, clean, typically non-plastic such as GW, GP, SW, and SP for soils which $wPI = 0$.
b) Soils which contain more than 12% fines and exhibit some plasticity, such as GM, GC, SM, SC, ML, MH, CL and CH, for which $wPI > 0$.

The term, wPI, a weighted Plasticity Index is defined as:

$wPI = P_{200}*PI$

where

P_{200} = percentage passing #200 sieve (in decimal)
PI = Plasticity Index (in %)

For coarse, clean soils ($wPI = 0$),

$$\mathbf{CBR = 28.09\ (D_{60})^{0.358}}$$

where,
D_{60} = Diameter at 60% passing from the grain size distribution (mm)

The above equation is limited to D_{60} values greater than 0.01mm and less than 30mm. For D_{60} less than 0.01mm, the recommended value of CBR is 5. For D_{60} greater than 30mm, the recommended value of CBR is 95.

For plastic soils ($wPI > 0$),

$$\mathbf{CBR = 75 / [1 + 0.728(\mathit{wPI})]}$$

In addition, as CBR tests are more commonly carried out in Malaysia compared to tests to determine k, the following preliminary correlation between CBR and k based on the recommended range of values in Table 1 is proposed:

$$\mathbf{\mathit{k\ (pci)} = 31.823*CBR^{0.6237}}$$

It should be noted that FAA recommends that the design subgrade CBR should be chosen on the basis of the design value should be equal to or less than 85% of all the subgrade CBR values. This corresponds to a design value of one standard deviation below the mean.

FAA also recommends that the maximum CBR for unstabilised gravel subgrade shall be 50 and a design k value of 500 lbs/in^3 (136 MN/m^3) shall not be exceeded for any subgrade in the design of the pavement.

3.6 Flexural strength of concrete

As the primary action of a concrete pavement slab is flexure, concrete strength is assessed by the flexural strength. The flexural strength of the concrete can be determined by ASTM C 78 test method. It can also be estimated from the compressive strength using the formula below:

$$\mathbf{R = 9\ (f'_c)^{1/2}}$$

where, R = flexural strength (psi)
f'_c = compressive strength (psi)

4.0 EVALUATION OF AIRPORT PAVEMENT

Pavement evaluation is necessary to assess the ability of an existing pavement to support different types, weights, or volumes of aircraft traffic. Therefore, with the introduction of Boeing 777 and Airbus A-380, some of the existing pavements will need to be evaluated to ensure satisfactory performance. Due to space constraint, only a brief introduction to pavement evaluation and overlay design are discussed.

The evaluation of pavement can be carried out based on records research, site inspection, sampling and testing (direct sampling procedures or non-destructive testing), etc. One of the commonly used tools in the evaluation of airport rigid pavements is the determination of the Pavement Condition Index (PCI). The PCI is a numerical rating indicating the operational condition of an airport pavement based on visual survey. PCI values range from 100 for a pavement with no defects to 0 for a pavement with no remaining functional life. The PCI is measured using ASTM standard test method D5340, Standard Test Method for Airport Pavement Condition Index Survey. Reference can also be made to Advisory Circular 150/5380-6A. Based on the PCI value, the Structural Condition Index (SCI) is derived which is a measure of the condition of the existing rigid pavement to assist in the design of overlays.

Once the existing pavement conditions are known, the design of the overlay can be carried out according to the following groups:

a) Hot mix asphalt overlay of existing flexible pavement
b) Concrete overlay of existing flexible pavement
c) Hot mix asphalt overlay of existing rigid pavement
d) Concrete overlay of existing rigid pavement

Existing pavements may also be evaluated for use by the new Boeing 777 and Airbus A-380 with the Aircraft Classification Number/Pavement Classification Number (ACN/PCN) system described in ICAO, 1983 and Advisory Circular AC150-5335-5. The ACN is a number expressing the relative loading severity of an aircraft on a pavement for a specified standard subgrade strength. The PCN is a number expressing the bearing strength of a pavement for unrestricted operations. The ACN value of the new aircraft can then be compared to the

existing PCN value of the pavement to determine whether restricted or unrestricted operations of the new aircraft should be permitted.

ACN values for most of the aircrafts in use have been published by the ICAO and FAA and can be readily used for comparison with PCN values of the pavement under evaluation.

5.0 SUMMARY

Some aspects of airport pavement design and evaluation have been discussed with the intention of highlighting the available methods for the design and evaluation of airport pavement to cater for the new generation of super-sized aircraft such as Boeing 777 and Airbus A-380. The layered elastic design theory has been presented together with a brief discussion on some important aspects of pavement design, pavement evaluation, the ACN/PCN system and overlays design. ■

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Dispute Resolution Practice Sub-Committee

The IEM Arbitration Rules 2003 – An Introduction

By: Ho Kin Wing

OVERVIEW

The Institution of Engineers, Malaysia (IEM) Dispute Resolution Practice (DRP) Sub-Committee embarked on drafting the new IEM Arbitration Rules in 2001 which eventually resulted in the publication of the IEM Arbitration Rules 2003 in November 2003 after it has been approved by the IEM Council.

The new IEM Arbitration Rules 2003 is a total re-drafting of the IEM Arbitration Rules 1994 (3rd Edition) although some of the good features were retained with modification to fit into the new IEM Arbitration Rules 2003 drafting style.

The DRP Sub-Committee decided that the new IEM Arbitration Rules should be based on the United Nations Commission on International Trade Law (UNCITRAL) Arbitration Rules 1976. This decision was based on the following objectives:

- To have a set of rules which is based on the international standard rules for arbitration;
- To have a set of rules that is familiar amongst the arbitration practitioners;
- Kuala Lumpur Regional Centre for Arbitration [KLRCA] has already adopted the UNCITRAL Arbitration Rules (with modification) as its arbitration rules;
- The new Malaysian Arbitration Act is anticipated to be based on the UNCITRAL Model Law;

The DRP Sub-Committee also has the following additional objectives in the formulation of the drafting of the new IEM Arbitration rules:

- To provide additional powers and jurisdictions to the arbitrator that the current Malaysian Arbitration Act 1952 does not provide;
- To provide a quick commencement and conclusion of arbitrations;
- To provide a flexible set of rules;
- To provide cost effective arbitrations;
- To provide an easy to follow and familiar set of rules;
- To provide a 'basic' set of rules for simple arbitrations.

In order to meet the last objective in the formulation for the drafting of the new IEM Arbitration Rules, the DRP Sub-Committee decided that a 'short form' arbitration rules has to be adopted and the Chartered Institute of Arbitrators Short Form Procedure (1991) has been used as the model for the 'basic' rules.

The new IEM Arbitration Rules has three parts to it, namely:

1) PART I - MODIFICATIONS TO UNCITRAL ARBITRATION RULES;
2) PART II - UNCITRAL ARBITRATION RULES; and
3) PART III - SHORT FORM ARBITRATION PROCEDURE.

Apart from the rules, the new IEM Arbitration Rules also has two annexures and several forms, and these are:

1) ANNEXURE A
IEM SCALE OF FEES FOR ARBITRATORS;

2) ANNEXURE B
INITIAL PROCEDURE FOR ARBITRATION UNDER PARTS I & II OF THE RULES [Where IEM President is the Appointing Authority]

3) FORMS:
a. Form IEM/Arb.1 (2003): Application to the President IEM to appoint an arbitrator;
b. Form IEM/Arb.1A (2003): Application to the President IEM to appoint an arbitrator;
c. Form IEM/Arb.1B (2003): Brief description of claim/counter-claim;
d. Form IEM/Arb.2 (2003): Candidates for appointment as arbitrator;
e. Form IEM/Arb.2A (2003): Declaration of Independence/ Impartiality and condition of appointment;
f. Form IEM/Arb.3 (2003): Nomination of candidates for appointment as arbitrator by the President of IEM;
g. Form IEM/Arb.3A (2003): Order of preference for candidates;
h. Form IEM/Arb.4 (2003): Appointment of arbitrator by the President IEM;
i. Form IEM/Arb.5 (2003): Acceptance of appointment by the arbitrator;
j. Form IEM/Arb.6 (2003): Acceptance of rules for arbitration and IEM scale of fees for arbitration;
k. Form IEM/Arb.7SF (2003): Application for arbitration using IEM Short Form Arbitration Procedure.

Following the KLRCA model, Part I of the IEM Arbitration Rules 2003 contains the particular articles that modify or amend the standard UNCITRAL Model Arbitration Rules with Part II the entire UNCITRAL Model Arbitration Rules verbatim.

Part III of the rules in the short form procedure for simple arbitrations of which the parties to an arbitration can adopt if they so wish under Article 15 of the Rules which will be discussed further in another article.

KEY FEATURES OF THE IEM ARBITRATION RULES 2003

With the objective of drafting a set of arbitration rules that are to be flexible as well as comprehensive in providing a platform for effective and efficient conduct of arbitrations, the new IEM Arbitration Rules 2003 has introduced quite a few unique rules which are not featured in other institutional arbitration rules in Malaysia. These are briefly discussed below.

As background, the UNCITRAL Arbitration Rules have been recommended by the United Nations General Assembly by its Resolution No. XXXI 98 which was adopted on the 15th December 1976, and have been widely accepted by the international community and it is the most widely used arbitration rules in the world with most arbitration centres around the world adopting these UNCITRAL Arbitration Rules as their base rules.

The UNCITRAL Arbitration Rules are comprehensive and internationally accepted set of rules which the parties under the IEM arbitration rules will be governed by in their arbitration arising under their contract or agreement to arbitrate under the IEM Arbitration Rules.

ENCOURAGE TO SETTLE

Under the IEM Arbitration Rules, Part I Rule 7 adds an additional paragraph to Part II Article 33, which provides an avenue for the arbitral tribunal before the publication of the final arbitral award to encourage the parties to settle the dispute. This provision was not included in the old IEM Arbitration Rules and indeed the inclusion of such a provision is unique and to the best knowledge of the writer is probably one of the few arbitration rules which allows the Tribunal to encourage the settlement of the dispute by other means during the arbitration. The thinking behind this additional paragraph is that the IEM as a responsible professional national body should encourage the resolution of disputes by whatever means and not only by arbitration.

DEPOSIT OF COSTS

In relation of deposit of costs, The IEM Arbitration Rules 2003 through Rule 11 of Part I [which supercedes Article 41 of Part II] treats the claim and counter-claim separately. The collective experiences of the DRP members have shown that many arbitrations have stalled due to one party to the arbitration refusing to pay for their portion of the deposit. Rule 11 with its treatment of the claim and counter-claim separately will facilitate the progress of the arbitration.

The first way it will assist the arbitration to progress is that when the respective deposits are paid up regardless who pays the entire amount the arbitration will proceed. The usual practice where the Claimant and Respondent are required to deposit equal amounts is still applicable but the claim and counter-claim deposit amounts are worked out separately. However with Rule 11, in the event that one party refuses to pay its portion of the deposit, then after 30 days of notice of payment of deposit, then the arbitral tribunal can direct the parties to pay up the remaining portion of the deposit. Once one of the parties pays up the remaining portion of the deposit, the arbitration can proceed for the claim.

The arbitration will proceed with the claim only and will not progress the counter-claim until and unless the counter-claim deposit is paid up. This will indirectly discourage Respondents from exaggerating or inflating its counter-claim amount as the deposit is a percentage of the counter-claim amount. The Rules [Rule 11(1)] also treat set-offs as counter-claims (for the purpose of payment of deposits only).

In the event that after 60 days that the deposits are not paid up in full, Rule 11 also gives the Arbitral Tribunal the power to suspend the arbitration. If the deposit still remain unpaid after a further 60 days of the suspension, the Arbitral Tribunal can withdraw after giving 30 days notice to the parties [Rule 11 (2)].

LIMITATION ON TIME AND COST

The Rules also gives powers to the Arbitral Tribunal to set time limits for each of the parties to present their cases after considering the complexity of the claim or counter-claim or set-off, as well as the magnitude of the amounts in dispute unless the parties disagree, under Rule 13.

Similarly, the arbitral tribunal may, after considering the complexity of the claim or counter-claim or set-off, as well as the magnitude of the amounts in dispute, set limits for costs to which the successful party shall be entitled.

ENHANCING THE JURISDICTION AND POWERS OF THE ARBITRAL TRIBUNAL

The IEM Arbitration Rules 2003 have incorporated the provisions as contained in the old IEM Arbitration Rules and has also introduced a wide ranging additional or enhanced jurisdiction and powers to ensure the effectiveness of conducting an arbitration that are either lacking or not provided for under the old rules or the Malaysia Arbitration Act 1952.

Some of these key jurisdiction and powers are described here below:

Determine Arbitral Tribunal Own Jurisdiction and Question of Dishonesty and Fraud

Under Part 1 Rule 14 (1) (d), the rules gives the power for the arbitral tribunal to determine its own jurisdiction and Part 1 Rule 14 (1) (e) gives the arbitral tribunal the power to determine any question of good faith, dishonesty or fraud related to the dispute provided that it is specifically pleaded.

Interim Measures of Protection

The IEM Arbitration Rules 2003 gives the arbitral tribunal the powers to conserve goods forming the subject matter in the dispute through an interim award [Part 2, Art 26] which can be taken as an injunction to prevent either party to sell, destroy, liquidate etc. any goods that is the subject matter of the dispute.

Default of Parties – Termination of Proceedings or Proceed Ex-Parte

Under Part 2, Article 28, it provides wide ranging powers to the arbitral tribunal in the event that either party fails to act within the timeframe set by the arbitral tribunal.

Article 28 (1) provides the arbitral tribunal the power to terminate the arbitral proceedings if the claimant fails to communicate his claim within the timeframe set.

In the case if the respondent fails to communicate his statement of defence, the tribunal may direct that the proceedings to continue. Similarly if one of the parties fails to appear at the hearing, the arbitral tribunal may proceed with the hearing [Part 2, Article 28 (2)].

When one party fails to provide documentary evidence within the timeframe set, the arbitral tribunal also has the powers to make an award based on whatever evidence that has been placed before the tribunal [Part 2, Article 28(3)].

Right for the Arbitral Tribunal to Admit Pupils During Proceedings and Publish Awards

For the purposes of education and training, under Part 1, Rule 15 (1), the arbitral tribunal can admit pupils at the hearings subject to either party not having valid objection.

The arbitral tribunal also has the right to submit to the IEM for publication of an award or refer to the award in articles etc. after all references to the identities of the parties has been removed. IEM can only publish such awards or articles after 3 years from the date of the final award.

SHORT FORM ARBITRATION PROCEDURE

The IEM Arbitration Rules 2003 has a set of supplementary rules called the short form arbitration procedure under Part 3 of the rules. This short form arbitration procedure is based on the Chartered Institute of Arbitrators, UK short form rules.

This short form arbitration procedure is extremely useful when the matters in dispute are not complex which means that simplified procedural rules will suffice. The option to arbitrate under the short form arbitration procedure is provided for under Part 1, Rule 15.

Both the parties must mutually agree to elect the use or adoption of the short form arbitration procedure [Rule 15(1)] and should submit a joint application using Form IEM/Arb.7SF (2003).

The arbitral tribunal can direct that the short form arbitration procedure (Part 3) notwithstanding the reference was for the arbitration to be in accordance with Parts I and II. However this can only be directed after receiving the parties' statement of claim and statement of defence as well as hearing the views of the parties on the suitability of the short form for that particular arbitration.

In cases where the total amount in dispute (total of the claim and counter claim amounts) is below RM200,000.00, then it is mandatory that the arbitration will be governed by this short form arbitration procedure.

The IEM Arbitration Rules 2003 is indeed a much needed shot in the arm for the effective and efficient conduct of arbitrations in Malaysia and will definitely complement the much anticipated new Malaysian arbitration act which is expected to be assented by the Malaysian parliament within the next 24 months.

Copies of the IEM Arbitration Rules 2003 can be obtained from the Secretariat of IEM. Request for a copy can be made to Ms. Nora, [E-mail: *sec@iem.org.my* or Tel: 603-7968 4001]. ■