International Civil Aviation Organization

The First Meeting of the Ad Hoc Afghanistan Contingency Group Meeting (AHACG/1)

Kuala Lumpur, Malaysia, 11-12 September 2014

Agenda Item 3: Europe- Southeast/South Asia Contingency Planning (scenarios, procedures)

EUROPE-ASIA MAJOR TRAFFIC FLOW CONTINGENCY PLANNING

(Presented by the Secretariat)

SUMMARY

This paper presents discussion proposals for the establishment of a Europe – Asia Major Traffic Flow Contingency Planning arrangement.

1. INTRODUCTION

1.1 Working Paper 19 (WP19) of the Second Meeting of the APANPIRG Air Traffic Management Sub-Group (ATM/SG/2) provided information in on certain aspects of the transition from military to civilian control of Afghanistan's airspace, and suggested considerations for sub-regional airspace contingency planning, should the Kabul Flight Information Region (FIR) become restricted, either in part of as a whole.

1.2 It was necessary even at the earliest planning stages to develop potential contingency schemes so they could be analysed and consulted.

2. DISCUSSION

Contingency Concepts

2.1 Given the likelihood for an urgent implementation in less than four months if a contingency operation is required, only short to medium term concepts from WP19 are discussed in this paper.

2.2 **Scenario A**: *Partial Kabul FIR Contingency Services* – in the event that some parts of the Kabul FIR are unable to be provided with an ATC service (most likely due to the loss of some VSAT facilities supporting VHF):

- If the upper airspace is not affected by military or security concerns, delegation of ATC responsibility in that portion of airspace to another ATC unit is considered possible but highly unlikely given the potential political difficulties and the short timeframe involved; or
- Closure of the affected ATS routes (this may cause congestion on other routes within the Kabul IR so may not be implemented unless the safety implications are managed).

2.3 **Scenario B**: *Kabul FIR Contingency Services* –

- If the upper airspace is not affected by military or security concerns, Thailand's Bay of Bengal Cooperative Air Traffic Flow Management System (BOBCAT) could be configured to operate H24 for both west and east direction traffic at a specified time-based separation such as 20 minutes, monitored by neighbouring ATC units; and
- Crossing ATS routes such as A219, A453, G202, G206 and G668 may need to be closed to ensure no converging traffic (see **Figure 1**); and
- Traffic Information Broadcasts by Aircraft (TIBA) could be utilised; and
- Aircraft should operate with lights and surveillance systems such as Automatic Dependent Surveillance-Broadcast (ADS-B) on; and
- Advisory services could be provided by an adjacent ATC unit (although this is unlikely given the short timeframe involved before 2015).

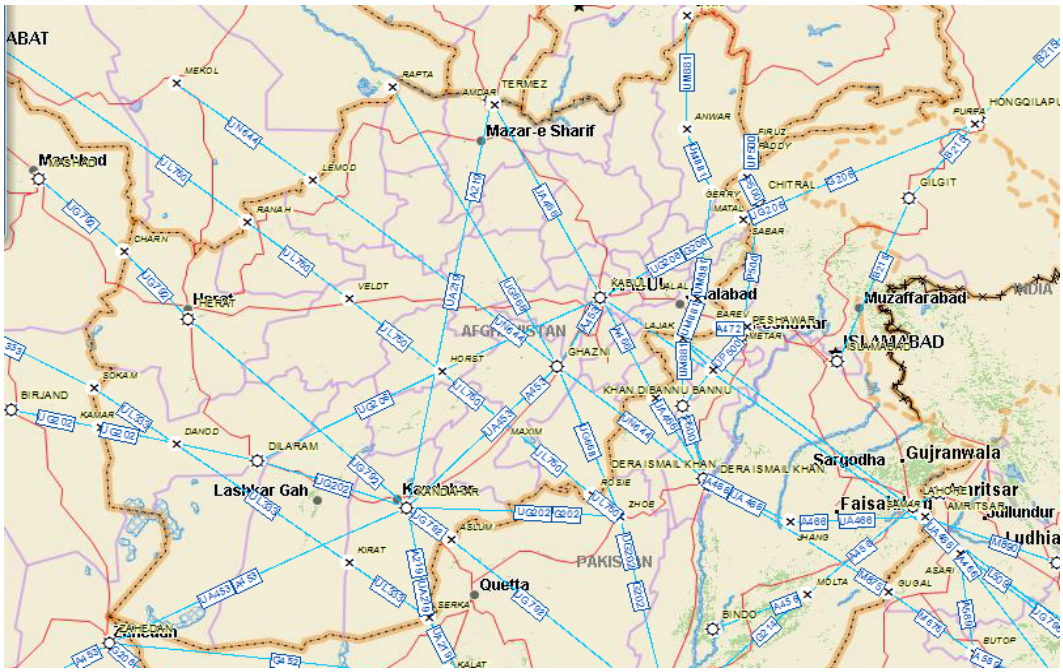

Figure 1: Kabul FIR international ATS Routes

2.4 **Scenario C**: *Iranian Airspace Routes* – this scenario appears to be the most likely for South Asian and Southeast Asian traffic, given that the Gulf traffic is very congested, and there were a number of 'hot spots' in Syrian, Iraq and European airspace that reduce the options for transit between Europe and Asia. More conceptual information on **Scenario C** is provided at paragraph 2.11.

2.5 **Scenario D**: *Middle East Contingency Procedures* – this would involve the Contingency Routing Plans for Asia/Middle East/Europe (CRAME 03[1]) procedures but as already mentioned, is inadvisable given the inability of Gulf airspace to support hundreds of extra transiting flights.

2.6 **Scenario E**: *ATS route L888 via China* – for some Southeast and East Asian traffic, routing north of the Himalayas via RNAV 10 route L888 is possible, but required sufficient Air Traffic Control (ATC) resources in China to manage the increased workload.

2.7 **Scenario F**: 'Silk Road' concept – this is a longer term concept for traffic north of the Himalayas so is not considered in this paper.

[1] Approved by the ICAO Council on 13 March 2003

2.8 Therefore, it was proposed that the only planning by the AHACG for Afghanistan contingency operations should involve:

a) **Scenario B**: *Kabul FIR Contingency Services**;

b) **Scenario C**: *Iranian Airspace Routes*; and

c) **Scenario E**: *ATS route L888 via China*

*Note – this does not preclude Afghanistan planning for **Scenario A**, which is required under Annex 11.

2.9 As far as **Scenario B** is concerned, there needs to be discussion by the ADACG on whether the proposed mechanisms to reduce risk suggested in paragraph 2.3 were acceptable or not; or whether there needed to be additional measures.

2.10 Regarding Scenario E, China would need to assess the current and possible future capacity on this ATS route and also consider the capacity of its neighbours. A capacity declaration and mechanisms for Air Traffic Flow Management (ATFM) to regulate the traffic on L888 would be necessary for the AHACG Afghanistan contingency arrangements.

Scenario C

2.11 Iranian contingency routes in **Scenario C** appear to be the only viable means of ensuring that South and Southeast Asian traffic can operate to and from Europe if the Kabul FIR is closed. The following contingency scheme focused on Iranian airspace (but extended as necessary into Turkish and Pakistan/Indian airspace if required) is proposed for consideration by the AHACG:

a) a high density Organized Track System (OTS, henceforth referred to as the 'Royal Road' OTS, after the ancient road between Persia and Anatolia) be established to accommodate the main northwest-southeast flow of air traffic, with either two or three near-parallel ATS routes using –

i. Flight Level Allocation Scheme (FLAS) for westbound flight levels FL300, FL340 and FL360 (**Figure 2**);

ii. FLAS for eastbound flight levels FL310, FL350 and FL370 (**Figure 2**);

iii. advisory (not mandatory) speed controls of Mach 0.79 - 0.81 for FL300/FL310, Mach 0.81 - 0.83 for FL340/FL350, and Mach 0.83 - 0.85 for FL360/FL370;

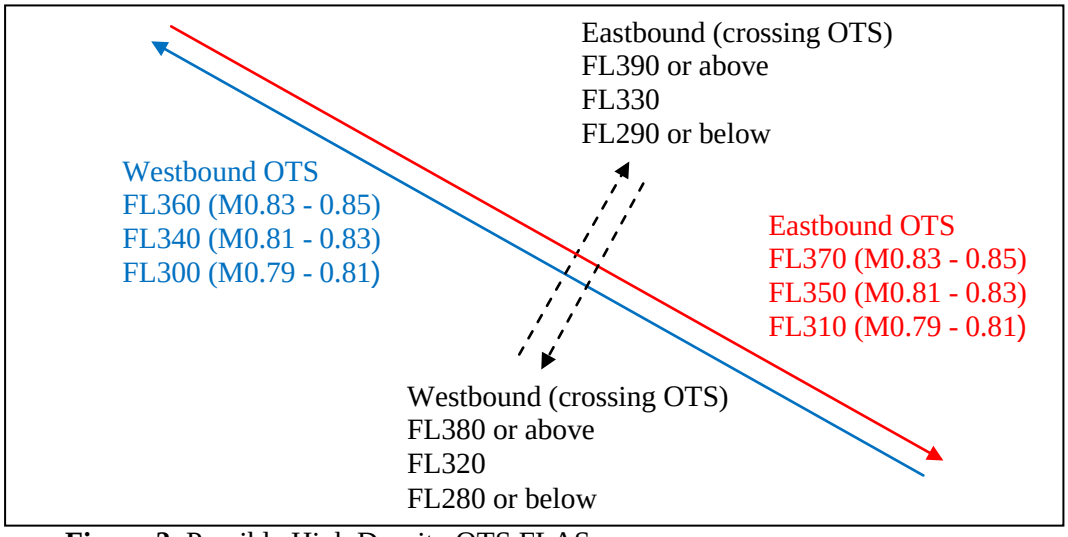

Figure 2: Possible High Density OTS FLAS

iv. BOBCAT or alternative traffic metering system to provide slots seven minutes apart, with a requirement for entry timing of plus or minutes two minutes from the allocated entry slot time (this would set an approximate 50NM - 55NM spacing, and a theoretical minimum deterioration to three minutes or 22NM - 24NM spacing in the worst case within ATS surveillance coverage);

v. Merging procedures for traffic departing Iranian airports so aircraft can join the OTS routes, preferably climbing to a level below the OTS FLAS, and then being vectored or delayed before safely merging (the sequence would need to be coordinated with the next State unless such traffic was accounted for in the traffic metering system);

vi. Mandatory carriage of ACAS (and possibly Automatic Dependent-Surveillance-Broadcast (ADS-B);

b) FLAS for westbound traffic crossing the Royal Road OTS of FL320 (or FL280 and below, or FL380 or above);

c) FLAS for eastbound traffic crossing the Royal Road OTS of FL330 (or FL290 and below, or FL390 or above);

d) A two-way route system (the 'Caucasus Corridor') laterally segregated from the Royal Road OTS which is dedicated for traffic between the Caucasus/Russia and South or Southeast Asia (**Figure 3**); and

e) A two-way route system (the 'Gulf Corridor') laterally segregated from the Royal Road OTS which is dedicated for traffic between the Gulf and Europe (Iran has already promulgated a suitable route from BONAM on the Ankara FIR boundary to DARAX on the Emirates FIR boundary, **Figure 3**).

Figure 3: Gulf and Caucasus Corridors

2.12 **Figure 4** provides an overview of the contingency scheme with the Gulf and Caucasus Corridors (red) if it is assumed that current ATS routes must be utilised for the Roral Road OTS (pink). The assumed maximum capacity is **102** aircraft per hour (8.57 aircraft spaced seven minutes apart, two routes and six flight levels).

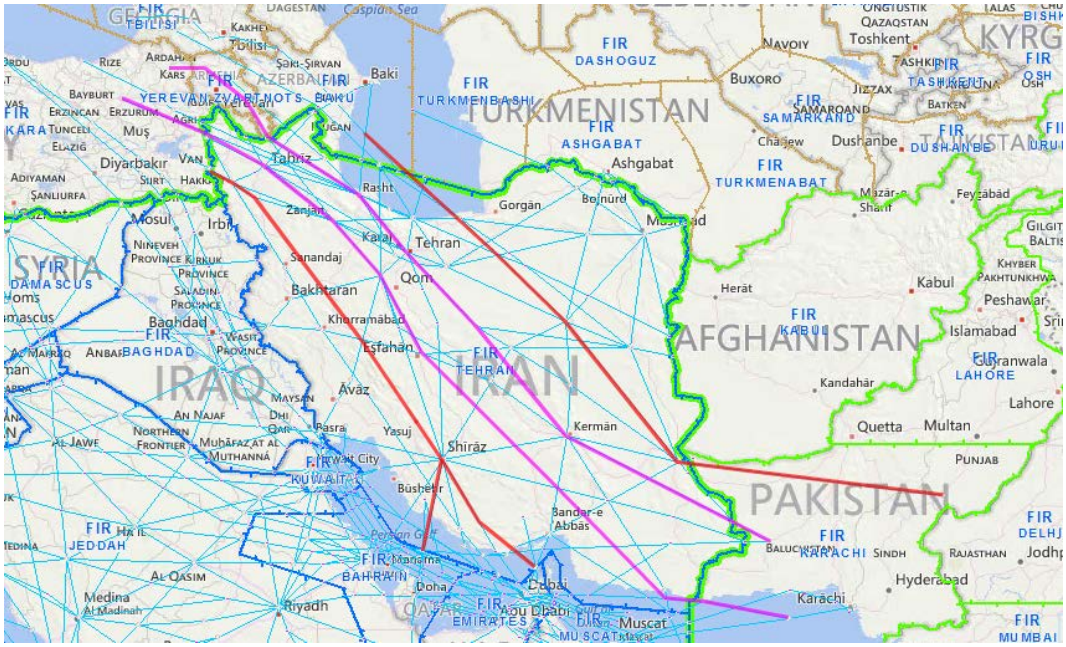

Figure 4: Royal Road OTS (existing ATS routes), with Gulf and Caucasus Corridors

2.13 **Figure 5** provides an overview if more direct RNAV routes can be utilised for the Roral Road OTS from existing entry and exit waypoints, dependent on aircraft equippage, civil/military cooperation and ATM constraints. An option for a third route merging with the Caucasus Corridor is posisble if that ATS route had light enough traffic that allowed tactical management of traffic (in this case the merging route from Armenia would not have traffic metering). This configuration would provide improved fuel and emissions efficiency, a necessary consideration when some aicraft may be at the limits of their range with Kabul airspace not being accessible. The assumed maximum capacity is **102** aircraft per hour (8.57 aircraft spaced seven minutes apart, two routes and six flight levels).

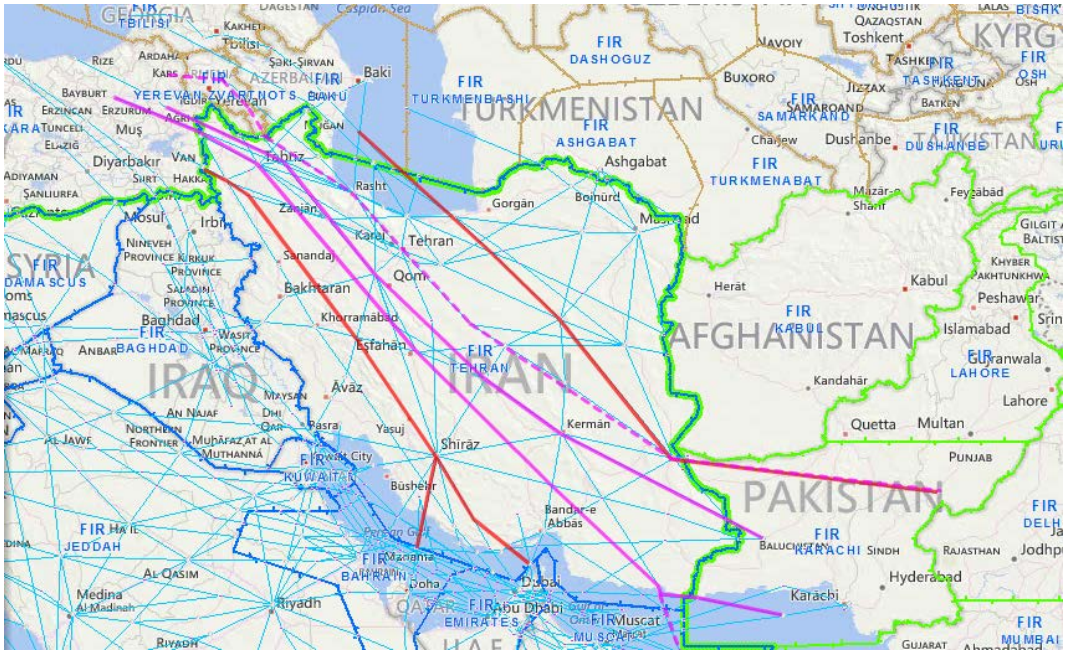

Figure 5: Royal Road OTS using RNAV and existing entry/exit waypoints

2.14 **Figure 6** provides an overview of an ideal contingency scheme if mostly direct RNAV routes could be utilised for the Royal Road OTS – without complete reliance on existing entry and exit waypoints, dependent on aircraft equippage, civil/military cooperation and ATM constraints. The assumed OTS maximum capacity is **154** aircraft per hour (8.57 aircraft spaced seven minutes apart, three routes and six flight levels). This configuration would also be the most fuel and emissions efficient.

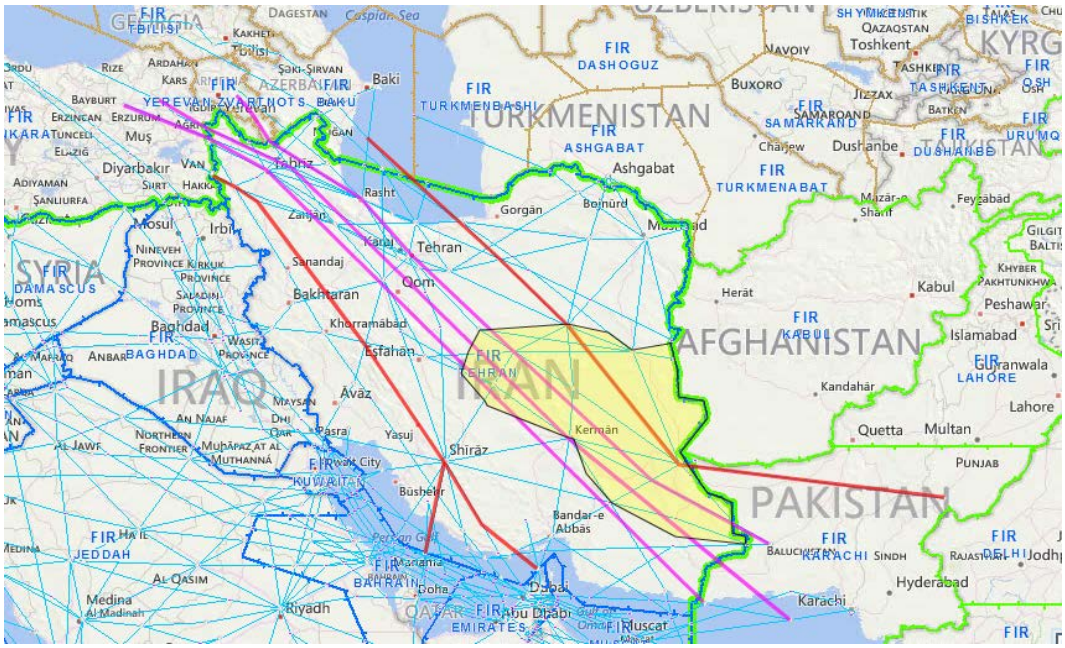

Figure 6: Royal Road OTS using RNAV and flexible entry/exit waypoints

2.15 It should be noted that the yellow portion of Iranian airspace in **Figure 6** has been declared as non-radar, which may present some difficulties in terms of monitoring a heavy flow of procedural traffic, unless the military can provide surveillance support such as data sharing or delegated monitoring, or other States can share ADS-B data in the area.

2.16 **Figure 7** and **Figure 8** are enlargements of the western and eastern portions of the possible scheme shown in **Figure 6**.

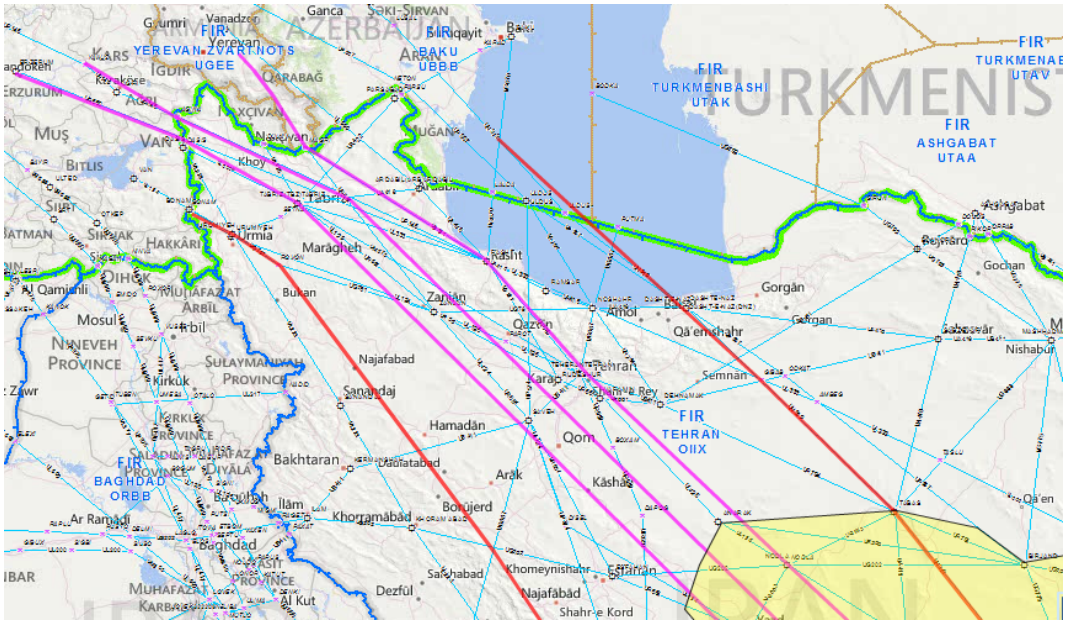

Figure 7: Royal Road western portion

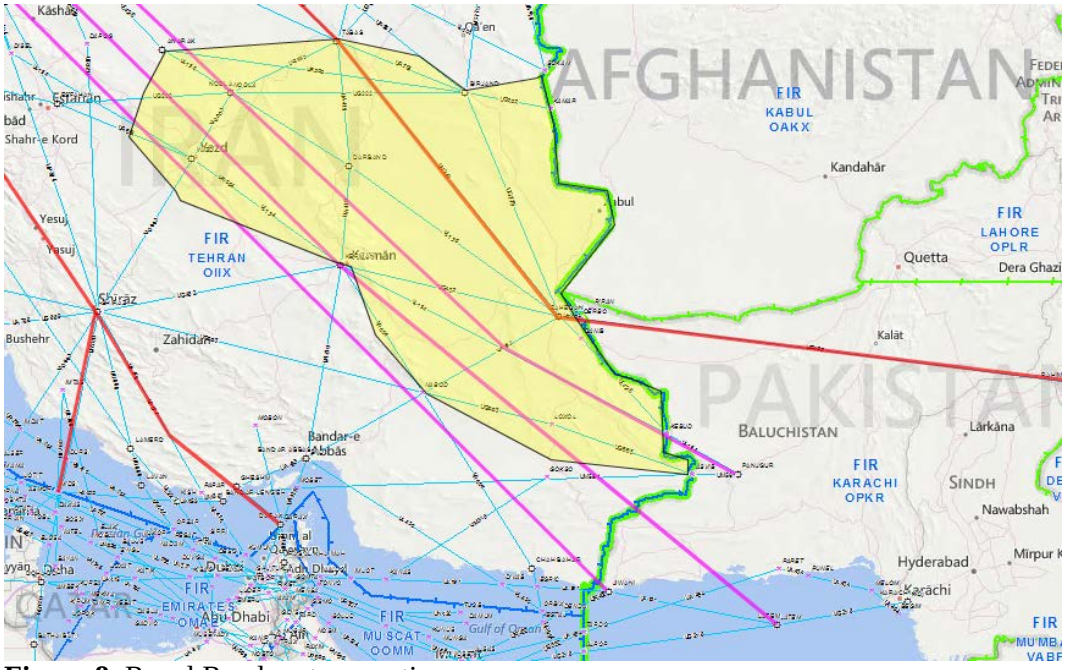

Figure 8: Royal Road eastern portion

2.17 It is posible that to reduce ATC workload, that the northern most OTS route should be mainly used by airlines operating from/to airports such as in Northern India, Bangladesh, and China, whereas the middle route could mainly service Southeast Asia, and the southmost route could service destinations such as Southern India, Sri Lanka, Maldives, etc.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) discuss the tentative proposals for contingency schemes, and in particular, the suggestions in paragraph 2.3 and 2.11 regarding Scenarios B and C respectively, in order to possibly reach consensus on basic contingency arrangements; and

c) discuss any other relevant matters as appropriate.

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