International Civil Aviation Organization

The Ninth Meeting of the Asia/Pacific Aeronautical Information Services – Aeronautical Information Management Implementation Task Force (AAITF/9)

Pattaya, Thailand, 24 – 27 June 2014

Agenda Item 5: Any Other Business

ICARD UPDATE

(Presented by Secretariat)

SUMMARY

This paper presents an update on the ICAO International Codes and Route Designators application (ICARD) and participation by Asia/Pacific States, discusses procedural issues related to the allocation of waypoint names in flight procedures, and identifies duplicated waypoint names in dangerous proximity.

1. INTRODUCTION

1.1 The International Codes and Routes Designators is the result of collaborative efforts by EUROCONTROL and the ICAO EUR/NAT Regional Office to develop and maintain a common database of facilities and services required for international air navigation within the EUR/NAT region. The first ICARD internet application on the EUROCONTROL website was developed to support the allocation of five-letter name-codes (5LNC) used for the identification of significant points for ATS routes and designators for ATS routes.

1.2 The application is now available for all ICAO States, and is the global repository and source of 5LNC. The ATS route designator function is only available within EUR Region.

2. DISCUSSION

ICARD Purpose and Registration

2.1 ICARD is the sole global source of unique, pronounceable 5LNC marking significant points (i.e. ATS route waypoints) not associated with a radio-navigation aid. The purpose of ICARD is to ensure that the global allocation of 5LNC complies with the Annex 11 requirements:

> *3.1 Where a significant point is required at a position not marked by the site of a radio navigation aid, and is used for ATC purposes, it shall be designated by a unique five-letter pronounceable "name-code" This name-code designator then serves as the name as well as the coded designator of the significant point.*
>
> *3.2 The name-code designator shall be selected so as to avoid any difficulties in pronunciation by pilots or ATS personnel when speaking in the language used in ATS communications. Examples: ADOLA, KODAP*

3.3 The name-code designator shall be easily recognizable in voice communications and shall be free of ambiguity with those used for other significant points in the same general area.

3.4 The unique five-letter pronounceable name-code designator assigned to a significant point shall not be assigned to any other significant point. When there is a need to relocate a significant point, a new name-code designator shall be chosen. In cases when a State wishes to keep the allocation of specific name-codes for reuse at a different location, such name-codes shall not be used until after a period of at least six months.

3.5 States' requirements for unique five-letter pronounceable name-code designators shall be notified to the Regional Offices of ICAO for coordination.

2.2 The ICARD application is the method by which States notify the ICAO Regional Office of their requirements for 5LNC. All requests for new 5LNC, or changes or deletions of existing 5LNC, are assessed for approval by a Regional Office ICARD_5LNC_MANAGER.

2.3 ICARD_5LNC_PLANNERs are State nominated individuals responsible for sourcing waypoints for each state from the blocks of codes allocated in ICARD to the State by the ICARD_5LNC_MANAGER, normally the ICAO Regional Officer ATM or Program Analysis Associate. Each State should nominate two persons to register as ICARD 5LNC Planners.

2.4 The ICARD_5LNC_PLANNER registration involves two steps:

i. Registration for ICARD through the ICAO Secure Portal; and
ii. Registration for ICARD_5LNC_PLANNER.

2.5 **Attachment A** provides instructions for the registration process. Further guidelines for the use of the ICARD application are available on the 5LNC web-page, which is fully accessible after the registration process is completed.

Asia/Pacific Region ICARD Participation

2.6 All States and administrations with any responsibility for or involvement in the design, implementation and/or regulation of ATS routes and instrument flight procedures should be registered in ICARD. In all cases where any personnel of a State Regulator or Air Navigation Service Provider are responsible for the allocation of 5LNC for ATS routes, Standard Instrument Departures (SIDs), Standard Terminal Arrival Routes (STARS) or Instrument Approach and Landing (IAL, including RNAV/RNP approaches), they must be registered as an ICARD_5LNC_PLANNER.

2.7 Traffic growth in the Asia/Pacific Region has resulted in traffic demand exceeding airspace capacity in many cases. The most effective response to this situation is to increase capacity, which will necessarily involve ATS route re-design and implementation of new routes, requiring the efficient and Annex 11-compliant allocation of waypoint names. This is also required to meet the increasing demand for waypoint names for implementation of new and revised RNAV and RNP flight procedures.

2.8 Several Asia/Pacific Region States/Administrations do not currently have any registered ICARD_5LNC_PLANNER. If these States or administrations allocate 5LNC outside the ICARD system they are unable to comply with the requirements of Annex 11.

2.9 **Table 1** provides a list of registered 5LNC_PLANNERS at May 2013 and June 2014.

State/Administration	5LNC_PLANNER	
	May 2013	**June 2014**
Afghanistan	1	1
Australia	2	5
Bangladesh	1	1
Bhutan		
Brunei Darussalam		1
Cambodia	1	1
China	1	1
Hong Kong, China	2	2
Macao, China		
Cook Islands		
DPR Korea		
Fiji	1	1
India	2	2
Indonesia	1	1
Japan	2	2
Kiribati		1
Lao PDR	1	1
Malaysia	1	1
Maldives		
Marshall Islands		
Micronesia		
Mongolia		
Myanmar		
Nauru		
Nepal		
New Caledonia	1	1
New Zealand		1
Pakistan	1	1
Palau		
Papua New Guinea	1	1
Philippines	1	1
Polynesie Francaise	2	2
Republic of Korea	1	1?
Samoa		
Singapore	2	2
Solomon Islands		
Sri Lanka	2	2
Thailand	1	1
Tonga		
Timor-Leste		1
Vanuatu		
Viet Nam	1	2

Table 1: Asia/Pacific Region Registered ICARD_5LNC_PLANNERs

2.10 **Attachment B** lists the currently registered ICARD_5LNC_PLANNERs for the Asia/Pacific Region. States are requested to check the list to ensure the details are correct, and to notify Bangkok Office of any change.

Proximity Checks

2.11 When submitting a selected 5LNC, Planners are required to conduct a proximity check. This involves using either the map or list function buttons to check for like-sounding 5LNC within 250NM for TMA waypoints or 500NM for En-route waypoints. The proximity check function requires the cartographical coordinates of the waypoint to be entered correctly.

2.12 The proximity check function may provide a list or map representation of several potentially like-sounding waypoint names. The Planner should then apply appropriate judgment to determine if any radiotelephony confusion between the existing waypoints and the proposed waypoint could occur. If such confusion could occur, a different waypoint name must be selected from the block of available codes. Once this process is complete, clicking the proximity check check-mark box will indicate that the proximity check has been completed.

2.13 The ICARD 5LNC_MANAGER may independently conduct another proximity check during the approval process. Any proposed waypoint found to have potential radiotelephony confusion with another waypoint will be rejected.

2.14 There have been a number of cases where requests for 5LNC have included indication that the proximity check has been completed, but a check by the 5LNC_MANAGER reveals like-sounding waypoints in proximity to the requested location. Recognizing that assessment of "like-sounding" should include consideration of the complex aviation communications environment, and the widely varied language background of pilots and air traffic controllers, it is recommended that personnel with appropriate levels of experience in operational air-ground-air communications are utilized to ensure that selected 5LNC cannot be confused with other like-sounding waypoints.

Process Flow for Requesting 5LNC

2.15 Recent occurrences suggest that States may be allocating 5LNC for use in flight procedure design before the flight procedure has been validated. This has resulted in follow-up requests to input corrected coordinates for the 5LNC that have already been approved in the ICARD system. The ICARD business rules do not permit changes to the coordinates of allocated 5LNC.

2.16 There have also been cases where 5LNC have been requested with no coordinates provided, in some cases indicating that a proximity check has been completed. These requests must be rejected.

2.17 The process for designing and implementing ATS routes and flight procedures should ensure that the final location of the waypoint is fully validated before then requesting the 5LNC in ICARD.

2.18 States should also note that codes may not be repositioned at new coordinates. Any code that is no longer required should be deleted in ICARD. It will be held in the reserve list before then being returned for allocation in a new block. If a code is held by the State for later re-use, the change request should indicate the date the previous location for the code was removed from AIP, and the date it is intended to be re-published.

Duplicate 5LNC – Dangerous Proximity Duplicates

2.19 ICAO has been working to progressively eliminate duplicated 5LNC globally. States may become aware that a duplicate code exists either by airspace user reports through the safety reporting system, or by email from the 5LNC Manager. Duplicate codes must be replaced.

Replacement of a duplicate code with a new code must be in accordance with Annex 15 change notification requirements.

2.20 In collaboration with industry partners ICAO Headquarters has identified a number of duplicates that are considered by industry to be dangerously proximate. ICAO Regional Office has been tasked with coordinating the elimination of these duplicates. **Table 2** lists the identified duplicates for the Asia/Pacific Region, and graphical representation is provided at **Attachment C**.

DANGEROUS PROXIMITY 5LNC DUPLICATES ASIA/PACIFIC			
5LNC	**FIR**	**LATITUDE**	**LONGITUDE**
DELTA	VIENTIANE	N 16 00 0000	E 105 45 0000
DELTA	BANGKOK	N 17 20 3500	E 100 56 0580
ROBIN	HONG KONG	N 21 02 4500	E 114 16 0600
ROBIN	TAIBEI	N 25 25 0900	E 122 12 2800
SANDY	FUKUOKA	N 33 43 0995	E 130 21 3389
SANDY	INCHEON	N 37 29 2000	E 126 34 5900
BAKER	HONG KONG	N 21 13 0200	E 114 39 0700
BAKER	TAIBEI	N 25 38 3600	E 121 52 4800
OCEAN	HONG KONG	N 21 48 4300	E 114 48 4800
OCEAN	TAIBEI	N 22 07 4857	E 120 24 5803
BETTY	HONG KONG	N 21 29 1080	E 114 33 3190
BETTY	FUKUOKA	N 24 12 2014	E 125 18 0384
CHAMP	FUKUOKA	N 27 55 0709	E 128 32 0505
CHAMP	INCHEON	N 37 32 0200	E 126 33 3700
SEPIA	INCHEON	N 37 21 0900	E 126 05 4700
SEPIA	TAIBEI	N 25 29 1305	E 121 34 3173
SKATE	HONG KONG	N 21 31 5500	E 115 08 4000
SKATE	MANILA	N 17 22 1117	E 124 25 3655
HALMA	FUKUOKA	N 25 53 3496	E 130 42 4005
HALMA	TAIBEI	N 23 11 5536	E 120 13 4881
PERID	FUKUOKA	N 38 09 4480	E 141 07 4943
PERID	KHABAROVSK	N 49 20 2500	E 141 07 4943
QUEEN	FUKUOKA	N 31 13 3462	E 131 33 3657
QUEEN	FUKUOKA	N 26 08 2223	E 122 01 1348
SANKO	SHENYANG	N 38 15 0000	E 122 27 1200
SANKO	FUKUOKA	N 33 33 3443	E 131 16 1723
SIKOU	HONG KONG	N 20 50 3600	E 111 30 0000
SIKOU	TAIBEI	N 24 02 3291	E 119 58 4217
UXENA	CHENNAI	N 12 27 4491	E 080 49 4520
UXENA	MUMBAI	N 19 34 4500	E 080 56 5100

Table 2: Duplicate 5LNC in Dangerous Proximity

2.21 ICARD_5LNC_PLANNERs for States identified in Table 2 should in the first instance work directly with other relevant States to agree on replacing duplicates with other 5LNC selected by ICARD. ICAO Regional Office will coordinate with States where required.

ATS Route Designator Allocation

2.22 Currently States must notify the ICAO Regional Office of any request for ATS Route designators. A database of available route designators for the Asia/Pacific Region is maintained by the Regional Office, and manually updated with each request. The process is also dependent on the parallel activity of progressing proposals for amendment (PfA) to the ATS Routes table in the Regional Air Navigation Plan.

2.23 The process is laborious and time-consuming for States and the Regional Office, and potentially induces handling errors. Given the expected increase in requests for new ATS route designators to facilitate necessary airspace capacity and efficiency outcomes, a more appropriate and up-to-date method is needed. States should be aware of the limitations of the current system available in the Asia/Pacific Region. The ICARD ATS Route Designators allocation function is not available to this Region.

ICARD_5LNC_MANAGER Actions

2.24 The 5LNC Manager will approve or deny requests for new code allocations, code deletions, and amendments to code information (e.g. addition of a coordinating State, addition of information regarding the use of the code, explanatory comments, but NOT changes to position coordinates). Other functions of the 5LNC Manager are the reallocation of unused codes to other States or Regions where requested and appropriate.

2.25 ICARD 5LNC code requests should normally be actioned within 1 week of submission. If there is any significant delay, or if approval is required urgently, ICARD_5LNC_PLANNERs should contact the ICAO Regional Office 5LNC Manager.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) ensure that each State/Administration has at least 1, and preferably 2, registered ICARD_5LNC_PLANNERs;

c) ensure ehac State’s representation in the list of current Asia/Pacific ICARD_5LNC_PLANNERs is correct;

d) discuss appropriate process flows for the allocation of waypoint names for ATS routes or flight procedures;

e) note and recommend any action on the issue of dangerous-proximity 5LNC duplicates;

f) discuss any action to improve the allocation process for ATS route designators; and

g) discuss any relevant matters as appropriate.

…….

ICAO - ICARD 5LNC State User Registration Procedure

Procedure for acquiring access to ICAO ICARD 5LNC web-based system

The following procedure allows ICAO State users to register on the ICARD application hosted on the ICAO secure portal located at http://portal.icao.int/. The ICARD State user registration procedure is intended for ICAO State users that are eligible to become ICARD 5LNC planner for their respective states.

The following table lists the ICARD focal points in the ICAO regional offices; those contacts can be used for any inquiry pertaining to ICARD with your respective ICAO regional office.

ICAO Region	Primary Contact	Alternate
Asia/Pacific Tel.: +662 537 8189	Shane Sumner ssumner@icao.int	Chuleeporn Leemanan cleemanan@icao.int

The ICARD focal point in your respective ICAO regional office will analyse your request for access and if approved, will communicate to the ICAO portal administrator your name and state and will inform you via email that you may start or continue the registration process on the ICAO portal. Any registration attempt without prior authorization from an ICAO regional office will be ignored by the ICAO portal administrator.

The standard acceptance message to inform you that you have registered to the ICARD group should look like the following:

Dear 'Your State User Name',

Your request for subscribing to group **icard** has been granted.

Welcome to the **icard** group.

The ICARD State user registration is a two-stage process.

- ✓ You need to be member of the ICARD group;
- ✓ Once authorized as an ICARD group member;
  you need to subscribe to the ICARD_5LNC_PLANNER group, to become an ICARD 5LNC planner.

Please make sure that you do not have a pop-up blocker activated on your internet browser before following the registration procedure.
If the procedure does not work, or if you have any problems, please contact the ICAO support service at ServiceDesk@icao.int for additional assistance on the procedure.

Here is how to complete those two steps:

INITIAL STAGE:

1. Go to http://portal.icao.int/ . If you do not have a login/password for ICAO's portal, choose **Request an account** (see Fig. 1) and go to Step 2, if you are already a user of ICAO's secure portal, choose **Login,** log in with your login/password, and proceed to Step 4.

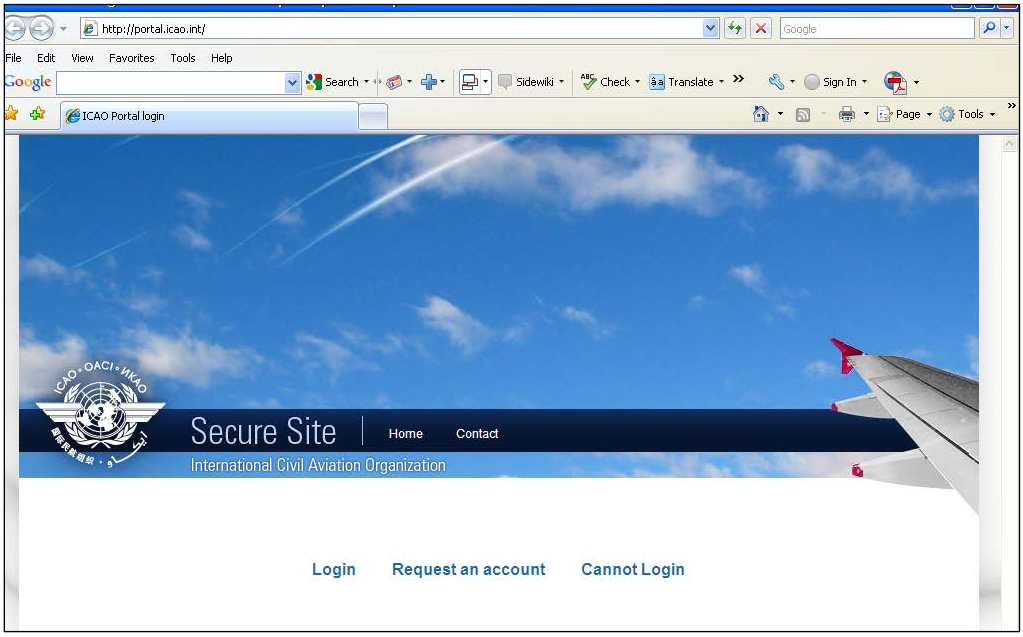
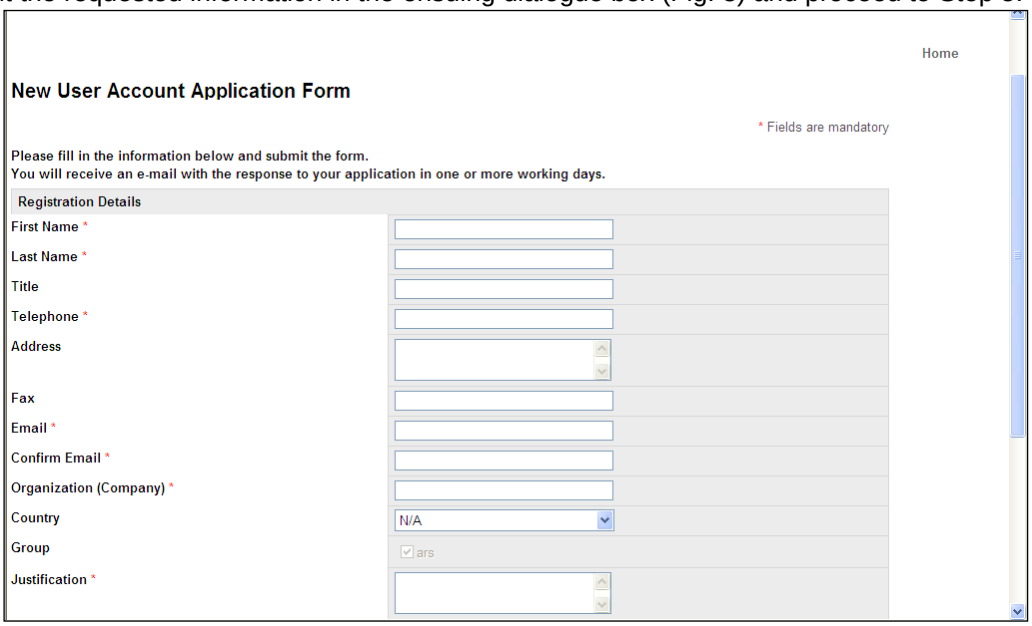


Figure 1

2. If you are requesting a new account, type in **ICARD** in "Group Name" of the resulting dialogue box (Fig. 2)

Figure 2

3. Fill out the requested information in the ensuing dialogue box (Fig. 3) and proceed to Step 5.



Note:

Figure 3

4. For users who already have an account, after logging in, click on the "Profile" link located on the top right of the page, then on the "Group Subscribe" (Fig. 4 & 5) of the ensuing page. Type in **ICARD** in the "Group Name" field of the resulting dialogue box.

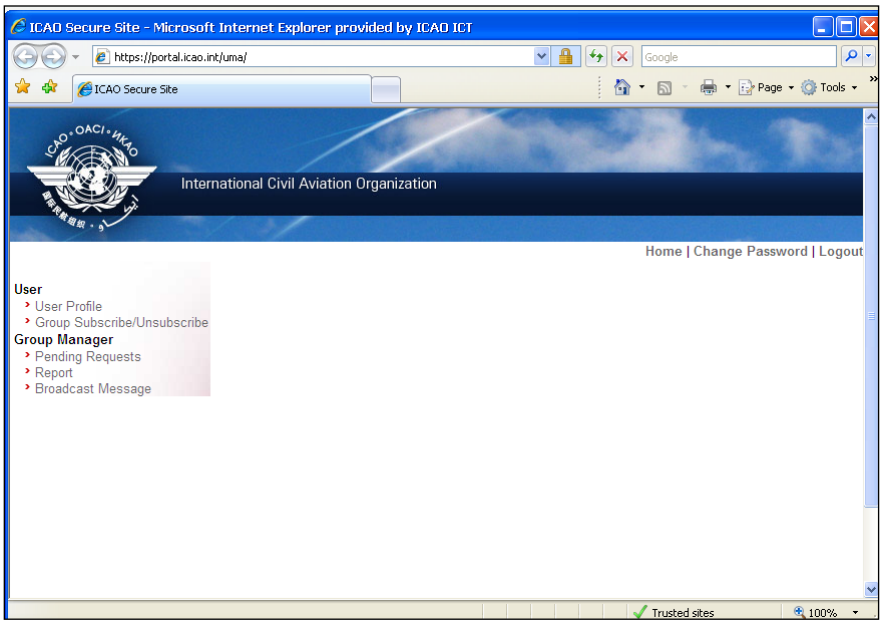


Figure 4

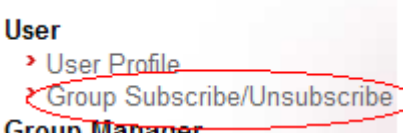


Figure 5

Once you are done, please click on the 'Submit Changes' button.

5. Whether it was a new account request, or an existing account request, you will get notification via email within 24 hours that your request for group membership has been granted.

You can then go to the web site http://portal.icao.int/ and log in. You will see **ICARD** as one of the available groups listed under "Secure Sites", clicking on this link will take you to the application.

5LNC PLANNER STAGE:

To become an ICARD 5LNC planner for your state, you need to take supplemental actions ***only once you have been confirmed a member of the* ICARD *group***. State users need to coordinate their registrations with their respective ICAO regional office prior to execute this stage; failure to do so will result in a denial of the request by ICAO.

1. Go to http://portal.icao.int/ . Choose **Login,** log in with your login/password.

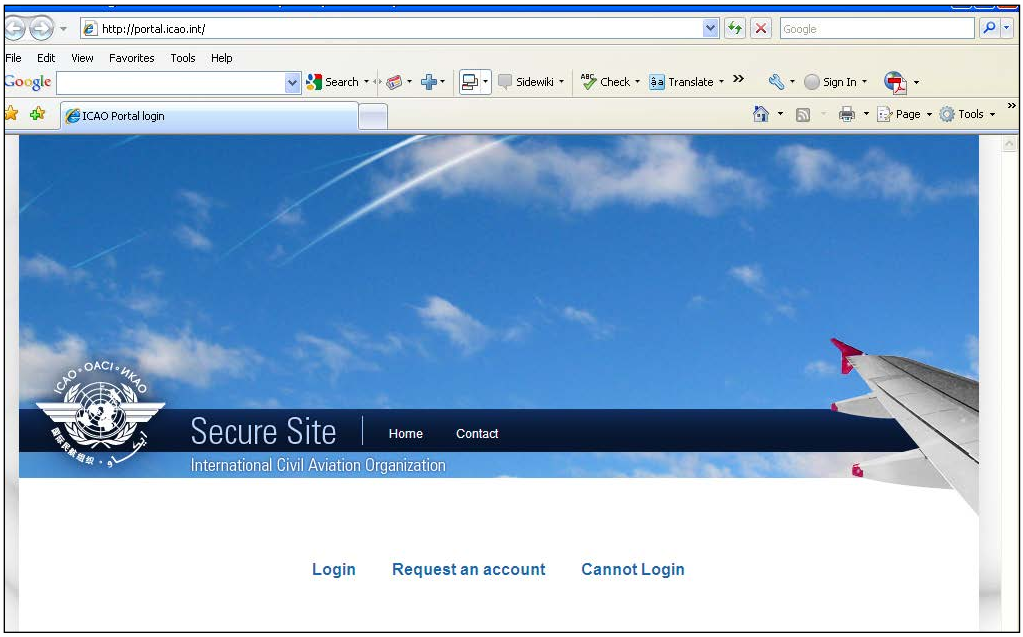


Figure 6

2. After logging in, click on the "Profile" link located on the top right of the page, then on the "Group Subscribe" (Fig. 7 & 8) of the ensuing page. Type in **ICARD_5LNC_PLANNER** in the "Group Name" field of the resulting dialogue box.

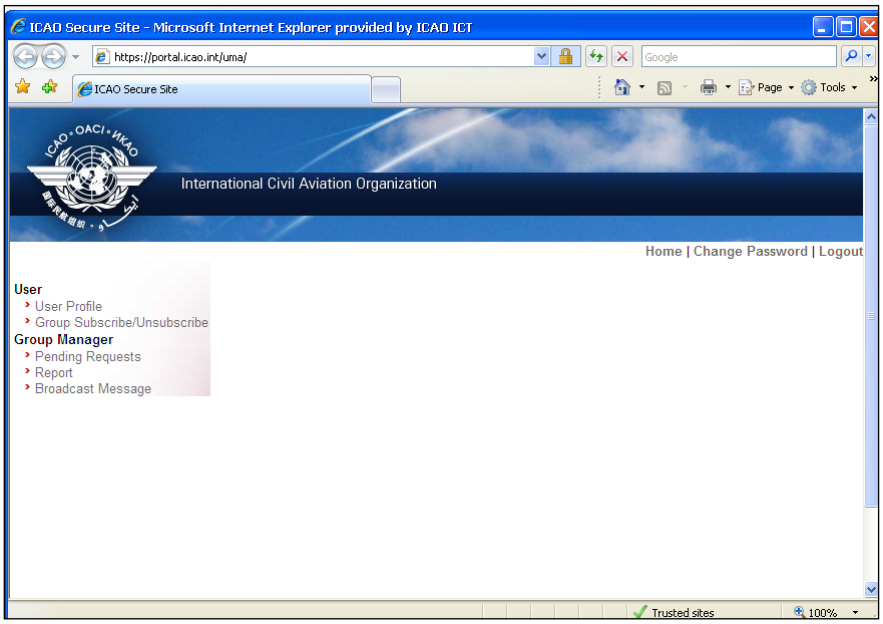


Figure 7

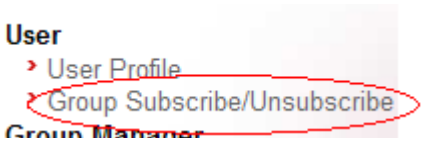


Figure 8

Once you are done, please click on the 'Submit Changes' button.

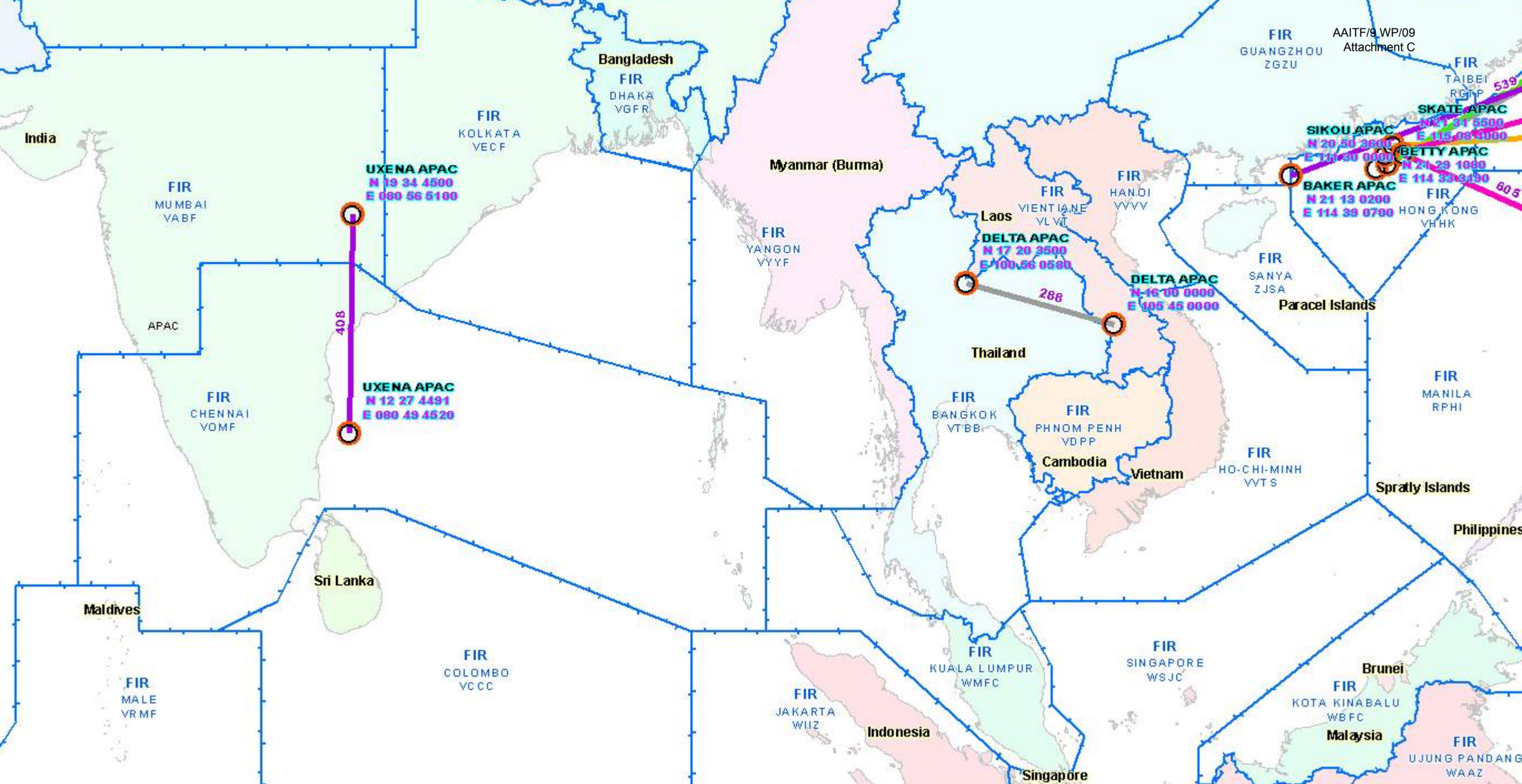
3. You will get notification via email within 24 hours that your request for group membership has been granted.

-- End --

Asia/Pacific Region ICARD_5LNC_PLANNERS				
State/Administration	**ICARD User Id**	**Surname**	**First name**	**Email**
Afghanistan	AAFCENT	AFCENT	Airspace	affora3aairspace@auab.afcent.centcom.mil
Australia	LALBERTS	Alberts	Louise	louise.alberts@airservicesaustralia.com
Australia	MMANGALIKA	Mangalika	Malani	malani.mangalika@airservicesaustralia.com
Australia	PTEO	Teo	Pinghan	pinghan.teo@airservicesaustralia.com
Australia	SDANVERS	Danvers	Sally	sally.danvers@airservicesaustralia.com
Australia	AMURRAY002	Murray	Andrew	andrew.murray@airservicesaustralia.com
Bangladesh	AHAQUE	Haque	AKM Faizul	faizul_bsl@yahoo.com
Brunei Darussalam	AHJABBAS	Hj Abbas	Azdah	azdah.abbas@civil-aviation.gov.bn
Cambodia	CSIVORN	Sivorn	Chhun	ans.ssca@gmail.com
China	YZHANG001	Zhang	Ying	zhangying@atmb.net.cn
Hong Kong, China	GCHENG	Cheng	Gabriel	gpkcheng@cad.gov.hk
Hong Kong, China	LFAN	Fan	Lucius	lwcfan@cad.gov.hk
Fiji	ITABAKAUCORO	Tabakaucoro	Ilaitia	ilaitia@caafi.org.fj
India	GRAGHUVANSH	Raghuvanshi	Gaurav	gauravr@aai.aero
India	SSWAMINATHA	Swaminathan	Subramanian	swamy64aqua2003@yahoo.com
India	AKUMAR001	Kumar	Arun	akjaincra@gmail.com
Indonesia	DYULIANSARI	Yuliansari	Dwi	dwi.yuliansari@yahoo.com
Japan	MSAKAI	Sakai	Miwa	sakai-m2jj@mlit.go.jp
Japan	NWATANABE001	Watanabe	Naoko	watanabe-n10nu@mlit.go.jp

Asia/Pacific Region ICARD_5LNC_PLANNERS				
State/Administration	**ICARD User Id**	**Surname**	**First name**	**Email**
Kiribati	BTABOKAI	Tabokai	Benitera	kiribatidca@gmail.com
Lao PDR	VDAVONE	Davone	VILAYSENG	davone_vs1@yahoo.com
Malaysia	AALI	Ali	Abdul Razak	razakali@dca.gov.my
New Caledonia	DFABIEN	Fabien	DINCLAUX	fabien.dinclaux@aviation-civile.gouv.fr
New Zealand	MTAYLOR	Taylor	Mark	mark.taylor@airways.co.nz
Pakistan	AMUMTAZ	Mumtaz	Arif	Arif.Mumtaz@caapakistan.com.pk
Papua New Guinea	CSAGATI	Sagati	Caleb	csagati@mail.casapng.gov.pg
Philippines	LLAURE	Laure	Lea	leajlaure@gmail.com
Polynesie Francaise	FMOUCHINLEU	Mou Chin Leung	Freddy	MOU-CHIN-LEUNG_Freddy@seac.pf
Polynesie Francaise	ALAPLANE	Laplane	Aurelie	mihalic_aurelie@seac.pf
Republic of Korea	HHA	Ha	Huho	hooho_ha@korea.kr
Singapore	HJUMARI	Jumari	Hermizan	hermizan_jumari@caas.gov.sg
Singapore	MSHEECHENGW	Shee Cheng Wah	Michael	michael_shee@caas.gov.sg
Sri Lanka	PDISSANAYAK	Dissanayake	Priyanthi	do@caa.lk
Sri Lanka	AJAYAWICKRA	Jayawickrama	Athula	das@caa.lk
Thailand	PHARNBUMRUN	Harnbumrungkit	Pawat	pawat@aviation.go.th
Timor-Leste	JLUISDACOST	Luis Da Costa	Jose	paize1@gmail.com
Timor-Leste	SHENRIQUES	Henriques	Sabino	henriques.sabino@gmail.com
Viet Nam	NHUNG	Hung	Nguyen The	hungand@caa.gov.vn
Viet Nam	BVO	VO	BUI	buivanvo@caa.gov.vn

ICAO Asia/Pacific Regional Office ICARD_5LNC_MANAGERS				
State/Administration	**ICARD User Id**	**Surname**	**First name**	**Email**
ATM Program Analysis Associate	CLEEMANAN	Leemanan	Chuleeporn	cleemanan@icao.int
Regional Officer ATM/AIM	SSUMNER	Sumner	Shane	SSumner@icao.int
Regional Officer ATM/SAR	LWICKS	Wicks	Len	LWicks@icao.int


India
Bangladesh
FIR
DHAKA
VGFR
FIR
KOLKATA
VECF
Myanmar (Burma)
FIR
YANGON
VYYF
FIR
MUMBAI
VABF
UXENA APAC
N 13 34 4500
E 080 56 5100
408
UXENA APAC
N 12 27 4491
E 080 49 4520
APAC
FIR
CHENNAI
VOMF
Sri Lanka
Maldives
FIR
MALE
VRMF
FIR
COLOMBO
VCCC
FIR
GUANGZHOU
ZGZU
FIR
TAIBEI
RCTP
539
SKATE APAC
N 21 31 5500
E 115 08 4000
SIKOU APAC
N 20 50 3600
E 116 30 0000
BETTY APAC
N 21 29 1080
E 114 33 3190
605
BAKER APAC
N 21 13 0200
E 114 39 0700
FIR
HONG KONG
VHHK
FIR
HANOI
VVVV
FIR
VIENTIANE
VLVT
Laos
DELTA APAC
N 17 20 3500
E 100 56 0580
288
DELTA APAC
N 16 00 0000
E 105 45 0000
FIR
SANYA
ZJSA
Paracel Islands
Thailand
FIR
BANGKOK
VTBB
FIR
PHNOM PENH
VDPP
Cambodia
Vietnam
FIR
HO-CHI-MINH
VVTS
FIR
MANILA
RPHI
Spratly Islands
Philippines
FIR
KUALA LUMPUR
WMFC
FIR
SINGAPORE
WSJC
Brunei
FIR
KOTA KINABALU
WBFC
Malaysia
FIR
UJUNG PANDANG
WAAZ
FIR
JAKARTA
WIIZ
Indonesia
Singapore

Mongolia
FIR ULAN BATOR ZMUB
FIR BEIJING ZBPE
FIR LANZHOU ZLHW
China
FIR WUHAN ZHWH
APAC
FIR KUNMING ZPKM
FIR GUANGZHOU ZGZU
FIR SHENYANG ZYSH
Russia
FIR KHABAROVSK UHHH
EURNAT
North Korea
FIR PYONGYANG ZKKP
South Korea
FIR INCHEON RKRR
FIR SHANGHAI ZSHA
FIR FUKUOKA RJJJ
Japan
Taiwan
FIR TAIBEI RCTP
Vietnam
FIR YANGON VYYF
FIR HANOI VVVV
FIR VIENTIANE VLVT
Thailand
Laos
FIR SANYA ZJSA
FIR HONG KONG VHHK
Paracel Islands
FIR MANILA RPHI
Philippines
FIR OAKLAND OCEANIC KZOA
Northern Mariana Islands

SANKO APAC
N 38 15 0000
E 122 27 1200

SEPIA APAC
N 37 21 0900
E 126 05 4700

CHAMP APAC
N 37 32 0200
E 126 33 3700

SANDY APAC
N 37 29 2000
E 126 35 5900

PERID APAC
N 38 09 4480
E 141 07 4943

SANDY APAC
N 33 43 0995
E 130 21 3389

SANKO APAC
N 33 33 3443
E 131 16 1723

QUEEN APAC
N 31 13 3462
E 131 33 3657

CHAMP APAC
N 27 55 0709
E 128 32 0505

QUEEN APAC
N 26 08 2223
E 122 01 1348

SEPIA APAC
N 25 29 1305
E 121 34 3158

HALMA APAC
N 25 53 3496
E 130 42 4005

BETTY APAC
N 24 12 2016
E 125 18 0384

SIKOU APAC
N 24 02 3291
E 119 58 4217

HALMA APAC
N 23 11 5535
E 120 13 4884

OCEAN APAC
N 22 07 4857
E 120 24 5803

SKATE APAC
N 21 31 5500
E 115 08 4000

SIKOU APAC
N 20 50 3600
E 111 30 0000

BETTY APAC
N 21 29 1080
E 114 33 3190

BAKER APAC
N 21 13 0200
E 114 39 0700

DELTA APAC
N 17 20 3500
E 100 56 0580

SKATE APAC
N 17 22 1117
E 124 25 3655

577
676
498
455
663
632
646
662
312
605
288

FIR
YAKUTSK
UEEE

Russia

FIR
IRKUTSK
UIII

EURNAT

FIR
KHABAROVSK
UHHH

PERID EURNAT
N 49 20 2500
E 133 15 5200

FIR
MAGADAN/SOKOL
UHMM

FIR
ANCHORAGE OCEANIC
PAZA

Mongolia

FIR
ULAN BATOR
ZMUB

FIR
SHENYANG
ZYSH

676

China

FIR
BEIJING
ZBPE

North Korea

FIR
PYONGYANG
ZKKP

SANKO APAC
N 38 15 0000
E 122 27 1200

SEPIA APAC
N 37 21 0900
E 126 05 4700

577

CHAMP APAC
N 37 32 0200
E 126 33 3700

SANDY APAC
N 37 29 2000
E 126 35 5900

South Korea

APAC

FIR
INCHEON
RKRR

Japan

PERID APAC
N 38 09 4480
E 141 07 4943

FIR
FUKUOKA
RJJJ

SANDY APAC
N 33 43 0995
E 130 21 3369

SANKO APAC
N 33 33 3443
E 131 16 1723

FIR
SHANGHAI
ZSHA

FIR
WUHAN
ZHWH

663

498

455

632

QUEEN APAC
N 31 13 3462
E 131 33 3657

China

QUEEN APAC
N 26 08 2223
E 122 01 1348

SEPIA APAC
N 25 29 1305
E 121 34 3173

BAKER APAC
N 25 38 3600
E 121 52 4800

SIKOU APAC
N 24 02 3291
E 119 58 4217

478

510

539

646

Taiwan

HALMA APAC
N 23 11 5536
E 120 13 1881

BETTY APAC
N 24 12 2014
E 125 18 0384

Japan

662

OCEAN APAC
N 22 07 4857
E 120 24 5803

312

Hong Kong

Macau

BETTY APAC
N 21 29 1080
E 114 33 3190

SKATE APAC
N 21 31 5500
E 115 08 4000

ROBIN APAC
N 21 02 4500
E 114 16 0600

BAKER APAC
N 21 13 0200
E 114 39 0700

SIKOU APAC
N 20 50 3600
E 111 30 0000

605

SKATE APAC
N 17 22 1117
E 124 25 3655

Philippines

Paracel Islands

FIR
BEIJING

FIR
WUHAN

FIR
SHANGHAI

China

FIR
PYONGYANG

SEPIA APAC
N 37 21 0900
E 126 05 4700

South Korea

577

291

FIR
INCHEON

Japan

SANDY APAC
N 33 43 0995
E 130 21 3389

SANKO APAC
N 33 33 3443
E 131 16 1723

663

498

455

QUEEN APAC
N 31 13 3462
E 131 33 3657

FIR
FUKUOKA

632

CHAMP APAC
N 27 55 0709
E 128 32 0505

QUEEN APAC
N 26 06 2223
E 122 01 1348

HALMA APAC
N 25 53 3496
E 130 42 4005

SEPIA APAC
N 25 29 1305
E 121 34 3173

ROBIN APAC
N 25 25 0300
E 122 12 2800

BAKER APAC
N 25 38 3600
E 121 52 4800

646

SIKOU APAC
N 24 02 3291
E 119 58 4217

BETTY APAC
N 24 12 2014
E 125 18 0384

FIR
TAIBEI

HALMA APAC
N 23 11 5536
E 120 13 4081

Taiwan

FIR
GUANGZHOU

FIR
HONG KONG

539

478

510

662

Hong Kong