

METHODOLOGY TO ASSESS ATS CAPACITY

ATFM Seminar for NAM /CAR Regions

Tegucigalpa, Honduras 27 to 31 March, 2006

**VICTOR HERNANDEZ
RO ATM/SAR
ICAO NACC OFFICE**

GUIDELINE FOR ATC STAFF PROVISION...

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INTRODUCTION

Doc 9426, Part II, Appendix C

PURPOSE:

- **PROVIDE PLANNING GUIDELINES FOR HUMAN RESOURCES IN ATC UNITS**

FUTURE DEVELOPMENTS:

- **EXPERIENCE**
- **ATS EVOLUTION (ATM)**

NACC/DCA-CONCLUSION 1/21

HUMAN RESOURCES AND TRAINING PLANNING

- **ATM**
- **Air Traffic Controller - TWR**
- **Air Traffic Controller - APP**
- **Air Traffic Controller - Area**
- **Air Traffic Controller – Radar/APP**
- **Air Traffic Controller Radar/Area**
- **ATC Operational Supervisor**
- **ATC/OJT Instructor**
- **ATS airspace planning Officer**
- **ATS regulations Officer**
- **ATS Quality Assurance Officer**
- **ATM Safety Officer**
- **ATM internal auditor Officer**
- **Search and Rescue (SAR) Officer for RCC or RSC**

APPLICATION CRITERIA

APPLICATION:

BASIC CRITERIA:

- **AVERAGE OPERATIONS VOLUME**
- **SHORT AND MEDIUM TERMS (2010-2015)**
- **INCREMENTS DECREMENTS, AS REQUIRED ARE RECOMMENDED**
- **AVERAGE PERCENTAGE OF LAST 6 MONTHS**
- **INCREASE ONE ATCO WHEN THE TOTAL NUMBER IS HIGHER THAN 50%**
- **DETERMINING REQUIRED PERSONNEL TO COVER WEEK DAYS OFF, VACATION PERIODS AND OTHERS**
- **JUSTIFY CHANGES FOR OTHER FACTORS**

GENERAL

- **8 HRS SHIFTS**
- **COVER POSITIONS IN ACCORDANCE WITH ATS UNIT PURPOSES**
- **TOTAL 3 ATCOS AS A MINIMUM IN EACH UNIT, EXCEPT WHEN PUBLISHED OPERATION SCHEDULE IS LESS THAN 6 DAYS A WEEK**
- **2 ATCOs, ONLY AS TEMPORARY MEASURE DURING VACATION PERIODS OR FOR UNFORESEEN CAUSES**

GENERAL...

REST PERIOD IN ATS UNITS:

- WHEN THERE ARE 2 OR MORE ATCOs
- SUBJECT TO TRAFFIC CONDITIONS, IN PEACK TIME PERIODS
- AVOID TO AFFECT TRAFFIC
- EQUITY DISTRIBUTION OF WORKLOAD
- RADAR ATCOS: 20 %
- ATCOS AVAILABLE IN JOURNEY PERIOD TIME

ATCOS PLANNING BY SHIFT PROCEDURE

OBJ: ESTABLISH AVERAGE OF OPERATIONS VOLUME THAT ATC PERSONAL MAY CONTROL BY SHIFT

$$SA = \left(\frac{3600}{N_c \times T_c} \right) \times .8 \times .5 \times N_h$$

SA	= OPERATIONS BY SHIFT AVERAGE (ops/hr)
3600	= SECONDS PER HOUR (sec/hr)
. 8	= 80 % OF ESTIMATED TRAFFIC HANDLING TIME (tffc handled)
. 5	= FACTOR OF MAXIMUM CAPACITY IN PEAK HOUR (cpcty peak/hr)
Nh	= NUMBER OF HOURS PER SHIFT (# hrs)
Nc	= NUMBER OF ESTIMATED CONTACTS BY AIRCRAFT (# contacts/acft)
Tc	= ESTIMATED AVERAGE TIME BY CONTACT (estimated time/contact)

**AVERAGE OPERATIONS THAT ATC
PERSONNEL (ACC) MAY HANDLE IN ONE SHIFT
(8 HRS)**

RADAR DUTIES:

➤	Tc	=	COMMUNICATION TRANSFER	30"
➤	COM	=	COMMUNICATION (INSTRUCTIONS)	75"
➤	C	=	SEPARATION	<u>45"</u>
				150"

$$C = \frac{3600}{TC+COM+S} = \frac{3600}{150} = 24 \text{ OPS/h}$$

$$24 \text{ OPS} \times 8 = 192$$

**AVERAGE OF OPERATIONS THAT ATC
PERSONNEL (ACC) MAY HANDLE IN ONE SHIFT
(8 HRS)**

NON RADAR DUTIES

- COR = COORDINATION
- CO = COMMUNICATION
- S = SEPARATION
- TCO = COMMUNICATION TRANSFER

$$C = \frac{3600}{COR+CO+S+TCO} = \frac{3600}{240} = 15 \text{ OPS/h} : 105$$

AVERAGE OF THE NUMBER OF OPERATIONS THAT AN ATC MAY HANDLE PER SHIFT (8 HRS)

▪ TWR (ADIZ)	8 CONTACTS 20 (160) X 8	= N
▪ TWR	12 CONTACTS X 20 (240) X 8	= N
▪ APP NON RADAR	12 CONTACTS X 20 (240) X 8	= N
▪ APP RADAR	10 CONTACTS X 20 (200) X 8	= N
▪ ACC RADAR	8 CONTACTS X 20 (160) X 8	= N

ANNUAL DEMAND (COVERING ATCOS)

ADDITION OF THE SCHEDULED LEAVE DAYS

104	WEEK DAYS OFF (52 X 2)
20	VACATION PERIOD
5	HOLYDAYS
1	BIRTHDAY
<u> X </u>	TRAINING, AS REQUIRED
130	

NIGHT APPROX 40%

REQUIRED COVERING PERSONNEL...cont.

- ANNUAL CAPACITY (CAR)

AVAILABLE DAYS.

DEDUCT SCHEDULED ABSENT DAYS TO THE 365 DAYS OF THE YEAR

DAY 235 DAYS = 365 - 130

NIGHT 325 DAYS = 365 - 40 DAYS
10 X 38 (4 WEEKS)

REQUIRED COVERING PERSONNEL...cont,

- REQUIRED COVERING CAPACITY (CRR)

- CONSIDER A CAPACITY FACTOR TO FULFILL THE
REQUIRED ANNUAL COVERING DEMAND

- DIVIDE DEMAND (*dem*) BY CAPACITY (*cap*)

DAY CRR= $\frac{130 \text{ dem}}{235 \text{ cap}}$ = F (0.553)
8 HRS.

NIGHT CRR= $\frac{40 \text{ dem}}{235 \text{ cap}}$ = F (0,170)
10 X 38

REQUIRED COVERING PERSONNEL...cont.

- REQUIRED COVERING CAPACITY (CRR)...cont.

MULTIPLY NUMBER OF ATCOS IN EACH SHIFT BY APPLICABLE FACTOR,

ADD RESULT TO TOTAL SHIFT PERSONNEL:

DAY $n \times 0.553$ + # ATCOS = N

NIGHT $n \times 0.170$ + # ATCOS = N

REMARKS

- ✓ CALCULATION NOT HIGHER THAN 80% OF INDIVIDUAL CAPACITY (ATCO) WHICH IS POSSIBLE TO MANAGE DURING THE SHIFT PEAK HOUR
- ✓ ASSESSMENT DETERMINED BY # OF OPERATIONS (VFR/IFR)
- ✓ IT DOES NOT FORESEE ADDITIONAL WORKLOAD (ATCO) NOR SECTORS CALCULATION
- ✓ INDIVIDUAL ATCO CAPACITY MAY INCREASE UP TO 100% WITH AN ASSISTANT
(CAPTURE FLIGHT PLAN DATA, COORDINATION, TRANSFER OR A COMBINATION OF THESE)
- ✓ THE HIGHER THE UNIT MORE CALCULATIONS SHOULD BE DONE
(THE HIGHER THE UNIT INCREASE, THE HIGHER THE COMPLEXITY)

REMARKS

- ✓ **DETERMINATION OF FIGURES BY FORMULAS, RIGID CALCULATION; IT DOES NOT ALWAYS CORRESPOND TO ASSIGNMENT MADE BY TABLES**
- ✓ **THE TOTAL SHOULD BE CALCULATED BY SHIFT CONSIDERING VACATION PERIOD AND OTHER FORESEEN ABSENCE VARIABLES**
- ✓ **IT DOES NOT FORESEE NON USED CAPACITY**
- ✓ **IT DOES NOT FORESEE SUPPORTING PERSONNEL (PLANNING, ORGANIZATION, SUPERVISION, ADMINISTRATION)**
- ✓ **IT DOES NOT FORESEE CPDLC ASPECTS NOR COMMUNICATION TECHNIQUES)**

Thanks!