**The SAS CMS Project**

**Functional Reference**

*Training functionality Carmen CMS*

*Document Type: Functional Reference*

*Version: 1.3*

*Last Changed: 25 Feb 2013*

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Change History

|  |  |  |  |
| --- | --- | --- | --- |
| Version | Author | Date | Description |
| 0.1 | Erik Gustafsson | 2008-09-26 | Initial document |
| 0.2 | Per Grönberg | 2008-09-27 | Assign training according to need/in instr. pos in tracking |
| 0.3 | Per Grönberg | 2008-10-01 | Planning: Select crew with/without training activity |
| 0.4 | Erik Gustafsson | 2008-10-02 | Added information on school flights. |
| 1.0 | Erik Gustafsson | 2008-10-06 | Fixes for FAT. |
| 1.2 | Erik Gustafsson | 2008-11-17 | Updates for Sp1 |
| 1.3 | Erik Gustafsson | 2008-11-24 | Added duty code V and other minor fixes |
| 1.4 | Erik Gustafsson | 2009-01-15 | Added some rec creating activities. |
| 1.5 | Erik Gustafsson | 2009-01-21 | Minor change regarding dates in crew\_training\_need |
| 1.6 | Erik Gustafsson |  | Several fixes and addition of simulator configuration options. |
| 1.7 |  |  |  |
| 1.8 | Erik Gustafsson | 2009-03-05 | Fixes to simulator tagging and release flights |
| 1.9 | Erik Gustafsson | 2009-03-12 | Updated handling of Skill test for A3/A4 crew |
| 1.10 | David Karlsson | 2009-04-08 | Updated training log table |
| 1.11 | Erik Gustafsson | 2009-04-15 | Updated info on flight instructors |
| 1.12 | Erik Gustafsson | 2009-04-20 | Added info on simulator need, CR 210 |
| 1.13 | Erik Gustafsson | 2009-06-05 | Updated training log info |
| 1.14 | Erik Gustafsson | 2009-08-07 | Updated info on PGT assignment and LC updating. |
| 1.15 | Erik Arnström | 2010-01-08 | Added section on CR 335 and CR 384 |
| 1.16 | Erik Arnström | 2010-02-12 | Updated for Sp6.2 (CR 381, CR 424) |
| 1.17 | Erik Arnström | 2010-05-25 | Updated for Sp7.2 (CR303, CR385) |
| 1.18 | Erik Arnström | 2010-06-18 | Updated for Sp8 (CR479) |
| 1.19 | Erik Arnström | 2010-06-21 | Fixes for CR385 and CR458 |
| 1.21 | Max Franklin | 2010-09-27 | Added NG\* in Training log for COURSE CC |
| 1.22 | Max Franklin | 2010-10-18 | Added NG\* in Training log for COURSE FD |
| 1.23 | Anna Olsson | 2011-02-07 | Fixed error in default values of supervision simulator briefing and debriefing. Also changed owner of document. |
| 1.24 | Arvid Bezelius | 2012-10-29 | Changed menu entries for Select to Filter |
| 1.25 | Viktor Almqvist | 2012-10-29 | Added functionality from SASCMS-3997 under section GROUND ACTIVITIES IN COURSES (2.5). |
| 1.3 | Viktor Almqvist | 2013-02-25 | CMS2 updates |
|  | Lars Westerlind | 2014-09-08 | Added 11 PERFORMANCE MANAGEMENT |
|  | Mikael Larsson | 2014-09-22 | Added 12 NEW HIRE FOLLOW UP |

# Introduction

This document, the functional reference for training functionality in Carmen CMS, is describing all functionality that is customized for training in the SAS CMS project.

It is common for Rostering and Tracking, with differences noted where applicable. It should be used in conjunction with the other functional references for tracking and rostering.

This “training” documentation also includes “Performance management” (PM) which is a related activity. PM has a very light weight implementation with few similarities to training, so it’s described in it’s own chapter.

# Creating ground training

Ground training is all non-flight activities that are part of various initial, conversion, refresher, and recurrent training. In CMS these should normally be ground duties, since this will enable, among other things, optimizer support, crew composition checks, and resource balancing. In some exceptions they should be personal activities, see below.

In general the ground training trips should be created by the planner. Exceptions are simulators that are fed into CMS from OAA (e.g. OPC, AST, ASF), and trips created by a tracker when a situation has arisen that requires this (i.e. changes in the schedule after the rostering time frame).

General info on how to create ground duties can be found in the common functional reference, what follows is some special cases of training trips.

## Cabin courses

Conversion and refresher courses should be created as personal activities on crew (normally from Manpower), with a correct activity code. The table cabin\_training will be used by CMS to check what qualifications etc. a course is valid for. It is the planner’s responsibility to ensure that the table has correct data.

## Recurrent training, REC/PGT

The yearly recurrent training for cabin (REC) and flight crew (PGT) is a special case of ground training. The activity code is based on the year and also on the qualification(s) of crew. This enables a dynamic calculation of the activity code, so there is no need to create the exact codes.

### REC (cabin crew)

For cabin crew recurrent trips are composed of web training, and a course activity (CX7). The web training must precede the course and should be created as N1 for ARN, N2 for CPH, N3 for OSL, and N5 for NRT. When assigned to a crew member they will then, for all visualizations, be converted to for example NS14. They should be created with a strictly defined crew complement (i.e. a specified number of positions for AP, AS, and AH). When optimizing all AS crew with a long haul qualification will be assigned as AS, short haul-only qualified AS crew will be assigned as AH.

The season code is based on a three-year cycle, with NS for 2008, NW for 2009, and NP for 2010. The qualification code is found in the table cabin\_recurrent, where a combination of the qualifications for a crew member, for example AL3690, is used to find the correct final digits. If a correct code can’t be found it will be displayed as “NSXX”, indicating that the planner needs to update the table with correct data.

### PGT (flight crew)

For flight crew recurrent PGT trips should be created as E1 for ARN, E2 for CPH, and E3 for OSL. When assigned to a crew member they will then, for all visualizations, be converted to for example EK13. They should be created with a free crew complement, i.e. using the TL position.

The season code is based on a three-year cycle, with EK for 2008, EH for 2009, and EJ for 2010. The qualification code is found using the standard mapping for flight crew:

36/38 > 3, 37 > 9, A2 > 2, A3 > 6, A4 > 4, CJ > 7, F5 > 5, M8 > 8.

Crew requiring a PGT refresher (EX\* code) will be illegal for regular PGT.

### Rehearsal training, PGT and REC

CMS supports defining specific crew as valid for rehearsal training on PGT for flight crew and REC for cabin crew. When the season code is calculated, it is taken into account if the crew is allowed for rehearsal training, and the season code will change accordingly. To define a crew member as allowed for rehearsal training, use the Crew Training application, where a check box is available to mark crew as valid for rehearsal training. Rehearsal PGT/REC is different from regular PGT/REC as it should be created as an activity and not a ground duty.

## Recurrent training, CRM/PC/OPC/AST

### CRM

The CRM trips should be created as ground duties, to enable optimizer support. They should have free crew complement (i.e. TL position).

### PC/OPC

PC/OPC simulators should be created as OPC duties (i.e. S\*-code), with a number indicating the valid qualification (the same as for PGT, see section 2.2.2). They should have a strictly defined crew complement, i.e. FC and FP positions. FR crew will always be assigned in the FP position.

When assigned to a crew in need of PC, or if tagged with a specific attribute, the OPC will be visualized for all situations as a PC (i.e. Y\*-code).

### AST

AST should be created with free crew complement (i.e. TL position). No dynamic code calculation takes place; they should be created with a complete code.

## Simulators, ASF, FFS, SIM

Simulators for flight deck should be created with free crew complement and complete code.

## Ground activities in courses

### Course subtype

If a course subtype is set in crew training need it will be set in all rows belonging to that course in the table crew\_training\_need. The course subtypes are chosen from a drop down menu, so before one can select a new subtype it has to be registered (written), using the table editor, in the table course\_subtypes. There is one default subtype “None” (this is also used by rave if nothing is set in the crew training need).

### Adding ground activities to courses

To add ground activities to a course that needs to be checked you add rows in the table course\_content. Each row represents an activity belonging to the course defined by course type and subtype (as well as ac\_qual and rank, these can both be set to ALL as default). Activities have attributes activity\_order, quantity and min\_hrs.

### Legality

The rule trng\_course\_ground\_activities\_performed\_fc checks that all activities in the table have been performed or planned when the first lifus flight is planned there will be an illegality. If an activity does not have a specific quantity (for example ordered activities) the quantity is assumed to be 1.

Activities with activity\_order > 0 are checked against each other. If an activity “A” in the course content table is given activity\_order=1 and another, say “B”, is given activity\_order=2 the rule trng\_course\_ground\_activities\_in\_order\_fc checks that when “B” is planned the rule “A” has already been planned or performed.

### Exceptions

The course content table lists so to say the default content in terms of activities for each course (depending also on ac\_qual and rank). Individual crew exceptions to the default content are given in the table course\_content\_exc. An exception is given activity by activity, so if we want a crew to have a different number of one certain activity you write that quantity in course\_content\_exc.

# Flight training

When crew is in need of training (initial, conversion, refresher etc.) they should be given a training program, defining the needed flight training. Usually this will be done by the Manpower user, who will use a course template to create necessary training need and related restrictions and qualifications. In some cases the planner or tracker will need to adjust this program, or even create a new one. Please see the common functional reference for information on how to do this using the Crew Training and Crew Info applications.

There is no optimizer support for flight training, the flights need to be assigned and locked in the database, and all handling of training attributes needs also needs to take place in the database environment.

## Defining a program

In general a training program will define a few items with a training type (e.g. X LIFUS or SUPERNUM), a number of legs/flights, in some cases a specific qualification, and for cabin crew: a maximum number of days to perform the training. The qualification field can be left empty; in that case all ac types will be valid for the training. All parts of the training program has the same course type (e.g. CONV) and the same date interval. The date interval is used to find crew with unfinished training programs and to trigger legality. To follow the progress of the training program, the report *Training Info* can be used.

### Example programs

#### Flight crew

Flight crew with 3-5 years of absence should have the following program:

**Course type**: REFRESH, **Start** 1Sep2009, **End** 31Oct2009

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Order | Type | Needed flights | Max days | Ac-qual |
| 1 | LIFUS | 6 | - | 36 |
| 2 | X LIFUS | 4 | - | 36 |
| 3 | LC | 2 | - | 36 |

#### Cabin crew

Cabin crew with 1-5 years of absence should have the following program:

**Course type**: REFRESH, **Start**: 1Sep2009, **End** 31Oct2009

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Order | Type | Needed flights | Max days | Ac-qual |
| 1 | SUPERNUM | 2 | 14 | 36 |
| 2 | RELEASE | 2 | 14 | 36 |
| 3 | NEW | 10 | 60 | 36 |

The max days are counted from the last RELEASE flight for training type NEW, and from the last work shop day (in this case a Conversion Refresher B, e.g. NF49) for any other training type.

### LIFUS buffer

In planning it is possible to add a buffer to the required LIFUS legs, using the parameter Extra LIFUS legs to assign above legal requirement (%). It will be used when assigning training flights according to need, but not in legality.

## Finding crew on training

To find crew with training programs, use the filter:

Assignment General > Filter > Training > Unperformed/Unplanned training

To find crew in need of a specific training type, use the filters found under:

Assignment General > Filter > Training > Flight crew/Cabin crew

## Assigning training flights

Training flights need to be explicitly assigned as training, with the exception of NEW flights for cabin crew with NEW+ACTYPE restriction. To aid in assigning there are two functions.

### According to need

Assigning according to need will check the training program of the selected crew to find the needed training type. If possible, it will then assign the trip with a correct position (for the training type) and set an attribute (i.e. the type of training). All legs in the trip will be assigned with the same position and attribute.

#### Planning

Trip object > Assign Training > According to need

#### Tracking

Trip object > Assign Training according to need

In Tracking it is also possible to use drag-and-drop with right mouse-click:

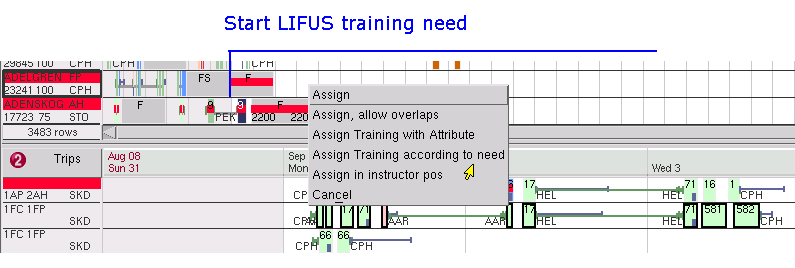


Figure 1: Assign according to need

Trip will be assigned according to crew’s current training program, in this case LIFUS.

### With attribute

Assigning training with an attribute will give the user the option of specifying the training type. It is useful for adding a buffer to the defined training need, and for certain kinds of training not defined in a program (e.g. recurrent line checks).

#### Planning

Trip object > Assign Training > With attribute

#### Tracking

Trip object > Assign Training with Attribute

In Tracking it is also possible to use drag-and-drop with right mouse-click in the same way as when assigning according to need, see section 3.3.1.2.

## Defining assigned flights as training

Already assigned flights are possible to tag as training flights by using the function:

Assignment object > Set training attribute

It will give the user the option of specifying the training type, and also the range (leg, trip, or all marked). It will modify the assigned position if necessary for the training type. In planning this will fail if the needed position is already fully assigned. In tracking the position will be changed anyway, possibly overbooking the position.

## Undefining assigned flights as training

If an assigned flight for some reason shouldn’t be considered as training it is possible to remove the training attribute. This can be done either directly with

Assignment object > Remove training attribute

or by setting the attribute to “None” for a specified range, using the same method as when defining an assigned trip as training.

## School flights

School flights are non-production flights performed in the initial stages of training. CMS defines flights as school flights based on their flight number as in the following table.

|  |  |
| --- | --- |
| Flight number | Region |
| 9160-9169 | SKD |
| 9180-9189 | SKS |
| 9260-9269 | SKN |
| 9280-9289 | SKI |

The need for school flights are 1/2/0/0//… CMS assumes crew assigned in FC position is acting instructor, and trainees should be assigned in FP position.

# Simulators

Simulators in CMS (type ASF, AST, FFS, OPC, and SIM) are user configurable when it comes to composition and briefing times. For legality it is also important to use only well defined simulators.

Four tables are related to simulator definitions, simulator\_set, simulator\_briefings, simulator\_composition, pc\_opc\_composition.

## Simulator definitions

### Valid simulators

Legality on recurrent simulators requires the assignment of a valid simulator, i.e. a simulator with a match in the table simulator\_set. If a simulator is assigned that in some way is invalid, a warning will be triggered in Planning (in Tracking, due to the possibility of ending simulators early due to sickness etc. a warning will not be displayed, but the simulator will not count as valid for recurrent training).

Table 1: simulator\_set

|  |  |  |
| --- | --- | --- |
| **Field** | **Type** | **Description** |
| grp | String | The simulator type |
| legtime | Reltime | The length of the individual simulator |
| multisim | Bool | If the simulator should be part of a two-leg duty |
| simdesc | String | Description of the simulator |
| Si | String | Supplementary information |

Example:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **grp** | **legtime** | **multisim** | **simdesc** | **si** |
| OPC | 2:00 | True | “2h+2h PC/OPC” |  |
| AST | 4:00 | False | “4h AST” |  |

### Composition

The need values for all positions on simulators in CMS are defined in the table simulator\_composition. Of special interest is the field special, used for defining the need of an alternate version of the simulator. It is currently only used for OPC simulators for two captains.

Table 2: simulator\_composition

|  |  |  |
| --- | --- | --- |
| **Field** | **Type** | **Description** |
| grp | String | The simulator type |
| special | Bool | Alternate version of simulator |
| validfrom | Abstime | Start date of validity of definition |
| validto | Abstime | End date of validity of definition |
| fc | Int | Need in FC position |
| fp | Int | Need in FP position |
| fr | Int | Need in FR position |
| tr | Int | Need in TR position |
| tl | Int | Need in TL position |

#### PC/OPC exception

For OPC simulators there are some extra definitions controlling the assignment of PC duties and below rank assignment. This is configured in the table pc\_opc\_composition.

Table 3: pc\_opc\_composition

|  |  |  |
| --- | --- | --- |
| **Field** | **Type** | **Description** |
| simtype | [reference] | The simulator type, as defined in simulator\_set |
| qual | String | The actype of the simulator (“\*” if it should apply to all) |
| validfrom | Time | Start date of validity of definition |
| validto | Time | End date of validity of definition |
| twofcsim | Bool | If the simulator is for two captains |
| pclimit | Bool | If the simulator should have maximum one PC duty assigned |
| allowedlower | String | Valid crew for lower assignment |

Example:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **simtype** | **qual** | **validfrom** | **validto** | **twofcsim** | **pclimit** | **allowedlower** |
| OPC+2:00 | 36 | 1Jan1986 | 31Dec2036 | False | False | INSTR |
| OPC+2:00 | \* | 1Jan1986 | 31Dec2036 | False | False | NONE |

Values will be found primarily on the exact actype, and if that fails (no values are found), on the general type (defined by “\*” in the qual field).

The field allowedlower can be one of NONE, ALL, or INSTR.

* NONE: No crew allowed below rank
* ALL: All crew allowed below rank
* INSTR: Crew with instructor or LCP qualification allowed lower

### Simulator briefings

Simulator briefings are controlled by the table simulator\_briefings. As for PC/OPC composition it is possible to define values for the exact actype, or for all actypes for the same simulator type.

Table 4: simulator\_briefings

|  |  |  |
| --- | --- | --- |
| **Field** | **Type** | **Description** |
| simtype | [reference] | The simulator type, as defined in simulator\_set |
| qual | String | The actype of the simulator (“\*” if it should apply to all) |
| validfrom | Time | Start date of validity of definition |
| validto | Time | End date of validity of definition |
| brief | Reltime | The briefing time. |
| midbrief | Reltime | The midbriefing time (if applicable) |
| debrief | Reltime | The debriefing time |

Example:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **simtype** | **qual** | **validfrom** | **validto** | **brief** | **midbrief** | **debrief** |
| OPC+2:00 | 37 | 1Jan1986 | 31Dec2036 | 0:30 | 1:10 | 1:00 |
| OPC+4:00 | \* | 1Jan1986 | 31Dec2036 | 1:45 | 0:00 | 0:45 |

A special case is supervision simulators that should have extra briefing time. The extra briefing and debriefing time is controlled by two parameters:

TRAINING: Extra briefing time for supervision simulators (0:15)

TRAINING: Extra debriefing time for supervision simulators (0:30)

### Simulator exceptions

It is possible to override the table-controlled definitions for composition, briefing times, and construction (i.e. whether the simulator is a two-parted simulator, or should only be one single object) on a per-simulator basis. The functionality is called as

Trip object > Simulator exception > Edit exception…

A form will be presented where the need for FC, FP, FR, TL, and TR, and briefing, midbriefing, and debriefing, and two-parted status can be modified. The briefing times should be entered as minutes (e.g. 1h15 is entered as 75). The max value for need is 19 (due to technical reasons) and for briefing times 999.

The exception will be used for all slices of the simulator, regardless the object it was called on.

To remove an exception, use

Trip object > Simulator exception > Remove exception

Exceptions on composition, briefings, and construction are created and removed at the same time.

## Tagging simulators

It is possible to set an attribute on simulators of type OPC, ASF, AST, and FFS to trigger certain behaviour. It is available both on assigned simulators, as

Assignment object > Set Training Attribute

and when assigning simulators as

Trip object > Assign Training > With attribute

The following attributes are available:

* **OPC FORCED**: Used to force a simulator to be identified as an OPC. Will disable recurrent period legality (available on OPC only)
* **PC FORCED**: Used to force a simulator to be identified as an PC. Will disable recurrent period legality (available on OPC only)
* **PC CHANGE**: Used to update the PC/OPC month to the month of the assigned simulator (available on OPC only)
* **SKILL TEST**: Used to define a simulator as a skill test (Z\*-code) (available on OPC only)
* **SIM ASSIST LANDINGS**: Used to define a simulator as a recency giving simulator (available on OPC, FFS, and ASF)
* **SIM ASSIST**: Used to force a simulator to be identified as an assist (available on all types)
* **SIM INSTR SUPERVIS**: Used on an instructor when giving supervision (available on all types)

### Airport simulators

CMS supports simulators for restricted airports/areas. It is implemented as regular FFS simulators that are tagged with the specific airport/area.

Available airports/areas are:

INN, UAK, NN, FNC, LCY

There are variables available in the filtering mask to enable searching for crew with expired qualification.

# Recurrent training

## Optimization

CMS supports the assignment of recurrent training using the optimizer. The rostering functional reference contains more info on the related costs etc.

## PGT Allotment

PGT slots on a base are distributed among the different fleet on that base. For example, in STO there are three different fleets, MD80, B737, and A3A4, sharing the same PGT slots. How many slots there are in total, how many slots each fleet can use, and the minimum required slots to be used is defined in the table pgt\_need. If there is no valid row for a certain base-qual-validfrom combination the min and max respectively is considered to be 0.

PGT courses are assigned in position TL; all ranks share the same slots. Assignment can be done manually, using the crew and trip filters for recurrent training as a help.

PGT assignment can also be optimized as described above (see [5.1]). In addition to the general costs of recurrent assignment there is the possibility to activate vertical constraints based on the pgt\_need table. Each row specifying a max allotment for a qualification translates into a constraint. See the rostering functional reference for more details on the constraint and associated cost.

Follow up on the PGT assignments compared to the specified min and max values are done via the report *PGT Distribution* as described in the reports functional reference.

Table 5: pgt\_need

|  |  |  |
| --- | --- | --- |
| **Field** | **Type** | **Description** |
| base | String | The base on which the PGT is performed. Must be a valid base. |
| qual | String | The qualification(s) that the max limit is for. Examples: M8, 36, A3A4, 3738 are all valid entries. |
| validfrom | Time | End date, PGT course should be inside interval |
| validto | Time | End date, PGT course should be inside this interval |
| min | Int | The min total allowed assigned slots for the base |
| max | Int | The max allowed assigned slots for the base or the max allotment for the specified qualification(s) |

### Configuring min/max PGT per base

This is an example of how to configure a min and max allowed assigned crew per PGT course for a base:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **base** | **qual** | **Validfrom** | **validto** | **min** | **max** |
| STO | \* | 1Jan1986 | 1Jan2020 | 4 | 5 |

It is very important that the qualification field contains an asterisk (“\*”), it must not be void or contain anything else.

### Configuring max PGT per base and qualification

This is an example of how to configure a max allowed assigned crew per PGT course for a base and qualification

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **base** | **qual** | **validfrom** | **validto** | **min** | **max** |
| STO | 36 | 1Jan1986 | 1Jan2020 |  | 1 |

The min field can either be void or any number; it will not be used for rows where a qualification is specified.

## Updating of recurrent documents

When a recurrent activity is considered performed (at least 24 hours after the assignment time) a night job will update the related documents.

The update job will check performed activities, and will check the assignment interval at this time. The planner has the responsibility to make sure (i.e. by using Crew Training) that the interval (typically the recurrent month and the two preceding months) is the wanted one. To handle legality concerning recurrent assignment too early, the nightjob sets a tag on the object to let CMS know it has been performed and that it has extended the related documents. If a user does a manual extension, this tag will not be set, and crew will become illegal.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type | Assigned | Attribute | Action | Note |
| [any] | Within/  After interval | - | Extend document | Note exceptions below |
| [any] | Before interval | - | No action | Will be illegal. Note exceptions below |
| CRM | Within interval | - | Extend document | The interval is every year |
| CRM | After interval | - | No action |  |
| PGTREF | - | - | Create document |  |
| ILC | - | - | Create LC document | - |
| LC | - | - | Create LC document | When the current LC document is for an actype which crew does not have |
| PC | Within/  After interval | -/  PC FORCED | Extend document, check that OPC validity is 6 months later | Both OPC documents will be checked for A3/A4 double qualified crew. After the interval the system requires the “PC FORCED” tag to define the sim as a PC. |
| PC | - | PC CHANGE | Create documents | For A3/A4 double qualified crew the other OCP document (OPCA4 when assigning a PCA3) will get its existing validity extended |
| PC | - | SKILL TEST | Create documents | For A3/A4 double qualified crew the other OCP document (OPCA4 when assigning a PCA3) will also be created |
| OPC | Within/  After interval | -/  OPC FORCED | Extend document(s) | For A3/A4 double qualified crew both the OPC documents will be checked |
| OPC | Before interval | -/  OPC FORCED | No action | Will be illegal unless tagged with “OPC FORCED” |
| REC/  RECSKN | After interval | - | No action |  |
| CRA, CRB, RECREF | - | - | Create documents | Creates or extends REC document. |

### Recurrent Update Info

To check what the night job will update once an activity is considered performed; the planner can use the report *Recurrent Update Info*. It is only available in database mode and will show, for the crew in window, the planned changes to crew’s recurrent documents.

# Instructors

## Flight training

All training flights need to have an appropriate instructor assigned in the correct position for the training type.

On unpublished data the calculation of duty codes, legality etc. is dynamic; when a crew is assigned in an instructor position, and holds a valid qualification for the training type on the flight, correct duty code etc. will be generated.

After rostering publish dynamic calculations are disabled and explicit tagging is required. This is indicated by legality warnings complaining about missing a tagged instructor.

A special case is training where the required position of the instructor can be assigned to more than one crew (e.g. AS TRAINING, or training on CRJ). In this case explicit tagging is always required.

### Qualification requirements

For instructors on flight training the correct qualification is checked by two composition rules:

* *OMA: Training flight/simulator must have appropriate companion*  
  Checks that a trainee is accompanied by an instructor with correct qualification. The rule always triggers in Tracking, and in Planning it triggers when the intended position for the instructor is fully assigned.
* *OMA: Crew must be appropriate instructor for training flight*  
  Checks that a crew member assigned in a position intended for an instructor has the correct qualification.

For flight crew there exist a hierarchy between the qualifications: TRE > SUP > SFE > TRI > SFI, e.g. when the requirement is at least SFE, an instructor with TRE, SUP, or SFE will suffice.

|  |  |  |
| --- | --- | --- |
| Category | Type | Requirement |
| FD | LC | LCP |
| FD | ILC | LCP |
| FD | LIFUS | At least SFI |
| FD | ZFTT LIFUS | TRE or TRI |
| FD | X LIFUS | At least SFI |
| FD | T-FLIGHT | LCP or at least SFI |
| FD | RELEASE | At least SFI |
| FD | FBF | LCP or non-restricted crew |
| FD | CNF | LCP |
| FD | BU DUAL | At least SFI |
| FD | NEW HIRE FOLLOW UP | Assigned Mentor |
| FD | School flt | TRI |
|  |  |  |
| CC | X SUPERNUM | SKD: No requirement  Other areas: AP or LINST |
| CC | AS TRAINING | AS INSTR |
| CC | AP TRAINING | AP\* |
| CC | NEW | Not new |
| CC | [all other] | AP or LINST\* |

\* On actype CJ the requirement is LINST. On actype 38 the requirement is AP.

### Tagging

The function: Assignment object > Tag as instructor

will check if the crew has a valid instructor qualification for any trainee on the flight and then, if needed, adjust the position and sets an attribute. Composition legality will always check that a trainee is accompanied by an instructor, even when the flight isn’t fully assigned.

## Simulators

The TR position on a simulator is defined as the instructor position, i.e. when assigned in this position it is automatically assumed the crew member is an acting instructor. Legality will of course still check for an appropriate qualification.

### Qualification requirements

For instructors on simulators the correct qualification is checked by the rule *OMA: Crew must have valid qualification for simulator*. The qualification hierarchy defined in 6.1.1 applies to simulators as well.

|  |  |
| --- | --- |
| Type | Requirement |
| Skill test | TRE |
| PC/OPC | At least SFE |
| Supervision | SUP |
| FFS | See 6.2.1.1 |
| [all other] | At least SFI |

#### FFS exceptions

For simulators of type FFS there exists five cases. Two cases use the table rave\_string\_paramset.

* Simulators with a task code found in rave\_string\_paramset under sim\_requiring\_min\_sfe will require at least SFE.
* Simulators with a task code found in rave\_string\_paramset under sim\_requiring\_tri will require TRI.
* Simulators with actype different from A2, A3, or A4, with task code ending with 12 will require at least SFE.
* Simulators with actype different from A2, A3, or A4, with task code ending with 13 will require TRI.
* All other cases will require at least SFI.

This is an example of how to define task codes that require a qualification other than at least SFI, table rave\_string\_paramset.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ravevar** | **Val** | **validfrom** | **validto** | **si** |
| sim\_requiring\_tri | C443 | 1Jan1986 | 31Dec2035 |  |
| sim\_requiring\_min\_sfe | C441 | 1Jan1986 | 31Dec2035 |  |

### Planning

In Planning the user can assign an instructor to a simulator with:

Trip Object > Assign > TR

To enable special behaviour (i.e. assigning a supervisor):  
Trip Object > Assign Training > With attribute

### Tracking

In Tracking the user can use a drag-and-drop with a right mouse click to assign an instructor to a simulator.

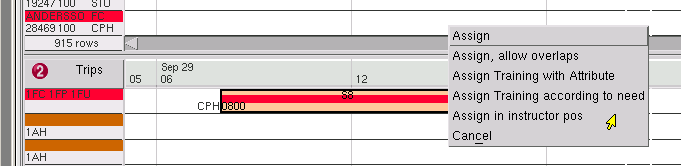


Figure 2: Assign simulator in instructor position

To enable special behaviour (i.e. assigning a supervisor):  
Trip Object > Assign Training with Attr

## Other activities

### Cabin recurrent instructor duties

Crew assigned on activities with code OL1, OL2, or OL3 are checked for INSTRUCTOR+REC qualification, with the rule: *OMA: Crew must be valid for recurrent instruction duty*.

# GUI functions

## Planning

In Planning a number of filters are available to facilitate the training process.

### Crew filters/sorts

#### Flight training

Assignment General > Filter > Training > …

It is possible to find crew on training, and also crew in need of specific training activities (as specified by training programs).

#### Recurrent training

Assignment General > Filter > Recurrent > …

Filters are available for all recurrent types, both on a “must have” level and a “may have” level. “May have” is all crew that are legal for assignment in the planning period (i.e. the earliest assignment date is before the end of the planning period), “must have” is all crew that must have the assignment in the planning period (i.e. the expiry date is the end of the planning period or earlier). The filters take account of planned activities, when assigned they will no longer appear in the filtering.

Some special cases are:

* OPC/PC > May be assist: Filters crew available for assist duty
* LC > May have LC, with LCP: Filters crew in need of LC together with LCP qualified pilots.
* REC Month > Jan, Feb, … Filters crew with specified REC month (cabin only).

Assignment General > Sort Crew > Recurrent > …

It is possible to sort crew on the month of their recurrent documents.

#### Filter crew with/without training activities

The option Assignment General > Filter > Training > By training activities… allows planner to search for crew by training activities. It is only available in database mode.

The option gives following dialog:

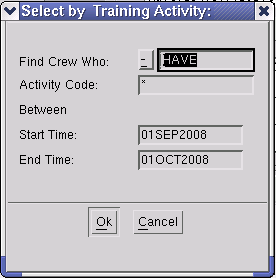


Figure 3: Filter crew by training activity form

The first option is HAVE / HAVE NOT, since the form can be used to find crew who hasn’t training activity with certain code in given period.

The activity code search allow usage of wildcard (‘\*’). For example, the setting HAVE NOT, NS\*, 01SEP2007 , 01SEP2008 will search all records (historic and roster) and filter crew who do not have any training activity with code starting with NS in period (inclusive end date).

### Trip filters

Trip General > Filter > Training

It is possible to filter the following kinds of training trips:

* Simulators (together with PGT)
* PGT
* CRM
* REC
* Simulators for two FC
* Simulators not fully assigned (Assist OPC/PC)

## Tracking

### Filtering crew with similar training

An additional fast filter named *Filter Crew with Similar* is added as a menu entry in the *Trip Object* menu. This filter works on both flights and training activities. The main purpose with this filter is to help the user in finding similar training activities assigned to some other rosters.

One use case where this is applicable is if a crew member gets sick when booked on a training activity and the tracker wants to find a suitable crew, booked on the same training later in time, to swap with.

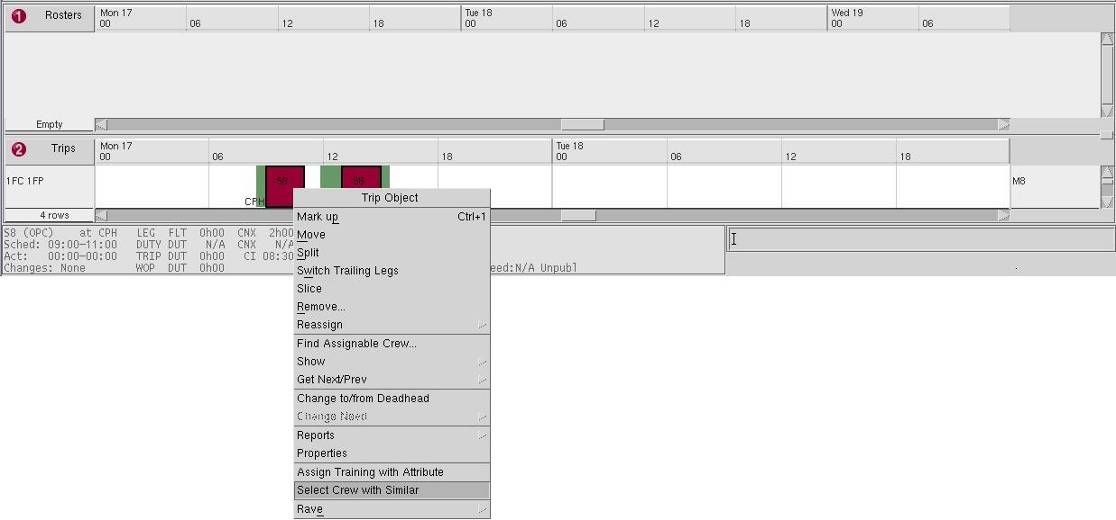


Figure 4: Searching for crew assigned on similar SIM activities.

### Showing Block Hours for Crew with NEW Restriction

The sum of block hours for a crew with a NEW restriction is shown in the Information Window. The summation starts from the valid from date of the restriction.

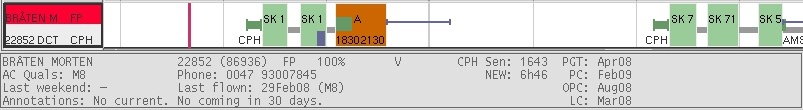


Figure 5: Crew information shows block hours up to current time

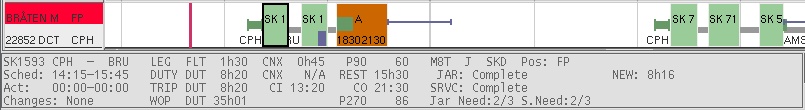


Figure 6: Leg information shows block hours including the flight

# Duty codes

Training activities will in general generate a duty code for both the trainee and the instructor, where applicable. It is required that the crew member is assigned in the appropriate position to generate a duty code.

## Flight crew

### Flight training duty codes

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Type | Rank | Assigned as | Long haul | Trainee code | Instructor code | Instructor position | Note |
| LC | FC | FC | No | S | UZ | FU |  |
| LC | FC | FP | No | LS | UZ | FU |  |
| LC | FP | FP | No | S | UZ | FU |  |
| LC | FC | FC | Yes | S | LLZ | FR |  |
| LC | FP | FP | Yes | S | LLZ | FR |  |
| LC | FR | FR | Yes | S | Z | FC |  |
|  |  |  |  |  |  |  |  |
| ILC | FC | FC | No | B | BU | FU |  |
| ILC | FP | FP | No | B | BU | FU |  |
| ILC | FC | FU | - | BU | B | FC | TRAINING+CAPT |
| ILC | FP | FU | - | BU | B | FC | TRAINING+CAPT |
| ILC | FC | FC | Yes | B | BLL | FR |  |
| ILC | FP | FP | Yes | B | BLL | FR |  |
|  |  |  |  |  |  |  |  |
| LIFUS | FC | FP | - | IL | I | FC |  |
| LIFUS | FP | FP | - | I | I | FC |  |
| LIFUS | FR | FP | - | I | I | FC |  |
|  |  |  |  |  |  |  |  |
| ZFTT LIFUS | FC | FP | - | IL | I | FC |  |
| ZFTT LIFUS | FP | FP | - | I | I | FC |  |
| ZFTT LIFUS | FR | FP | - | I | I | FC |  |
|  |  |  |  |  |  |  |  |
| X LIFUS | FC | FP | - | LX | X | FC |  |
| X LIFUS | FP | FP | - | X | X | FC |  |
|  |  |  |  |  |  |  |  |
| T-FLIGHT | FC | FP | - | LT | T | FC |  |
| T-FLIGHT | FP | FP | - | T | T | FC |  |
|  |  |  |  |  |  |  |  |
| RELEASE | FC | FP | - | RL | R | FC |  |
| RELEASE | FP | FP | - | R | R | FC |  |
|  |  |  |  |  |  |  |  |
| FBF | - | FP | - | L\* | \* | FC | \* “T” if LCP on flight |
|  |  |  |  |  |  |  |  |
| CNF | - | FU | - | NU | N | FC |  |
|  |  |  |  |  |  |  |  |
| BU DUAL | FC | FP | - | CL | C | FC |  |
| BU DUAL | FP | FP | - | C | C | FC |  |
|  |  |  |  |  |  |  |  |
| NEW HIRE FOLLOW UP | FC | FP | - | NS | NZ | FC |  |
| NEW HIRE FOLLOW UP | FP | FP | - | NS | NZ | FC |  |

### School flights

For trainees on school flights with a TRAINING+CAPT restriction, or a TRAINING+DCT restriction, an “I” will be generated. If an FC is assigned below rank an “L” will be added.

Instructors on school flights will get an “I”.

### Simulators

Crew on simulators will get a duty code in some special cases.

|  |  |  |  |
| --- | --- | --- | --- |
| Attribute | Position | Code | Note |
| SIM INSTR SUPERVIS | 4 | IZ |  |
| - | 10 | IS | When being supervised |
| - | 10 | I |  |
| SIM ASSIST | - | A |  |
| SIM ASSIST LANDINGS | - | AR |  |
| - | Below rank | L |  |
| [no attribute] | 4 | U |  |

## Cabin crew

All crew acting as instructors are assigned in AP position with the following exceptions:

* AS TRAINING where the acting instructor is assigned in AS.
* All training types on qualification CJ where the instructor is assigned in AH.
* X SUPERNUM flights for SKD where the mentor should be assigned above JAR need, in AH or AU.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Type | Region | Qual | Rank | Assigned as | Long haul | Trainee code | Instructor code |
| RELEASE | - | - | AP | AU | No | LR | IR |
| RELEASE | - | - | !=AP | AU | No | R | IR |
| RELEASE | - | !=CJ | AP | AH | No | LR | IR |
| RELEASE | - | !=CJ | !=AP | AH | No | R | IR |
| RELEASE | - | - | AP | AH | Yes | LR | IR |
| RELEASE | - | - | AS | AS | Yes | R | IR |
| RELEASE | - | - | AH | AH | Yes | R | IR |
|  |  |  |  |  |  |  |  |
| SUPERNUM | - | - | - | AU | . | U | I |
| X SUPERNUM | - | - | - | AU | - | UX | IX |
|  |  |  |  |  |  |  |  |
| AS TRAINING | - | - | !=AP | AU | - | SU | IS |
|  |  |  |  |  |  |  |  |
| AP TRAINING | - | - | - | AU | - | PU | IP |

**Note 1:** A RELEASE flight has two possible positions. CMS will assign in AH by default for SKD and AU for other areas, but by using *Change position* on the assigned trip, the position can be changed to AU for short haul flights without service need.

### New flights and 6 months follow up

For cabin crew with NEW+ACTYPE restriction, flight with the matching qualification will get an “N”.

For cabin crew with NEW+6M restriction, a “V” will be generated for all flights in the time interval defined by the restriction.

# Training log

In the Crew Training application it is possible to view a log of all historical training activities. It is updated at save. It is possible to see which items are found on the roster and which items are found in the log table. For flights the qualification is logged, for ground duties the activity code. Filter buttons are available that are based on the table training\_log\_set.

The following table defines what is logged. Each activity will only generate one log item, e.g. crew acting as instructor for LIFUS training will not be logged as “FLIGHT INSTR”, only as “LIFUS INSTR”. The only exceptions are “QUAL START”, “REQUAL START”, and “RELEASE AIRPORT” which will also generate a normal “RELEASE” log item, and “SIM DEADHEAD” which is generated by simulator duties starting and ending with passive flights. All items are logged with the start time in UTC.

|  |  |  |
| --- | --- | --- |
| Log type | Activity | Category |
| SCHOOL FLIGHT | Any school flight | FD |
| SCHOOL FLIGHT INSTR | Instructor on school flight | FD |
| FBF LCP | FBF flight with LCP | FD |
| NEW | New flights (crew has NEW+ACTYPE restriction for the flight) | CC |
| [training type] | Any flights with training type as defined in table crew\_training\_t\_set. | All |
| LCP SUPERNUM | Crew giving LC or ILC, assigned in SUPERNUM | FD |
| LCP | Crew giving LC or ILC | FD |
| LIFUS INSTR | Crew instructing on any LIFUS flight | FD |
| FLIGHT INSTR | Crew acting as any sort of instructor on flight training | All |
| SIM INSTR SUPERVIS | Instructor supervising on simulator | FD |
| SIM SUPERVIS | Instructor on simulator being supervised | FD |
| SIM INSTR | Instructor on simulator | FD |
| SIM ASSIST | Assigned as assist on simulator | FD |
| SIM ASSIST LANDINGS | Assigned as assist, performing landings | FD |
| PC | Simulators considered as PC or Skill tests | FD |
| [simulator type] | Any simulator of type OPC, AST, or ASF | FD |
| FFS | Any FFS simulator | FD |
| SIM AIRPORT | Simulators tagged with a restricted airport/area | FD |
| SIM | Any simulator not previously matched | FD |
| [activity type] | Any activity with group (as defined in table activity\_set) CRM, PGT, or EMG PGT | FD |
| COURSE | Activity with code TH1, TH8, EL\*, NG\* or SQ\* | FD |
| SEMINAR | Activity with code OA7\*, OA8\* or OA9\* | FD |
| FLIGHT AIRPORT | Flight to restricted airport | FD |
| RELEASE AIRPORT | Release flight to restricted airport | FD |
| CONVERSION REFRESHER B | Activity defined as CRB in table cabin\_training | CC |
| CONVERSION REFRESHER A | Activity defined as CRA in table cabin\_training | CC |
| RECURRENT REFRESHER | Activity defined as REC REF in table cabin\_training | CC |
| REFRESHER | Activity defined as REF in table cabin\_training | CC |
| CONVERSION | Activity defined as CONV in table cabin\_training | CC |
| RECSKN | Activity of type REC, as defined in table activity\_set, fulfilling the need for recurrent type RECSKN | CC |
| REC | Activity of type REC, as defined in table activity\_set, fulfilling the need for recurrent type REC | CC |
| REC CX | Activity with code CX7 | CC |
| COURSE WEB | Activity with code TW\* | CC |
| COURSE SCC | Activity with code CC\* | CC |
| COURSE | Activity with code OK\* or CS\* or CX\* or EL\* or SQ\* or NG\* | CC |
| QUAL START | Second consecutive flight with training type RELEASE when the qualification is less than 45 days old | All |
| REQUAL START | Second consecutive flight with training type RELEASE when the qualification is more than 45 days old | All |
| SIM DEADHEAD | Simulator duties starting and ending with passive flights, in the same day. Supporting CR385. | FD |

# Miscellaneous

## Blank days during training

In general no production is legal to assign to crew on training, but there is an exception for certain kinds of blank days. The parameter “BL codes used for training” (default values BL5, BL8, BL20) defines the blank day codes that should be legal to assign to crew on training, which is defined as crew with any restriction with main type TRAINING.

# Performance management

Performance management (PM) is a recurrent activity including meeting, which could be seen as a kind of training activity. However, there are no external “hard” demands to consider, and for several reasons a much simpler implementation was chosen, which is entirely described in this chapter.

## The activity

PM consists of two flight legs followed by a ground meeting with the same cabin crew attending all three activities. One of the assigned AH’s has a PMM qualification, meaning that he/she is leading the PM meeting afterwards and called PM Mentor.

A “validity period” is decided, under which each crew should attend this activity x times as student. No crew should attend more than y times in the period. First time the validity period is set to 12 months and each crew should attend once. If needed to compose valid rosters it’s allowed to assign two meetings perhaps.

In this version the trips are fixed manually (studio pairing), and the mentor is assigned and locked also manually. The rest of the assignment is done automatically in rostering optimizer, or adjusted manually.

Manpower is not used for the purpose at all. The output is only crew info, reports and utilities in studio.

## Changes

A crew qualification POSITION+PMM has been added, meaning the crew may be assigned as mentor for a PM activity.

Activity/task codes PMM/PM have been added used on ground activities representing the Pm meeting. PMM means attending as mentor, PM means attending as student.

Keys are added to be used in the property table, see below.

Some rules and one cost function have been added, see below.

Some filters have been added making Studio work easier with regard to PM.

Report output of crew properties has changed.

## Preparations

With table editor, add info about validity periods. In this example, we describe such a year starting on 1 oct 2013 and ending 23.59 30 sep 2014. It’s suggested to add 4 new rows for each validity period added.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| id | validfrom | validto | value\_abs | value\_int |
| pm\_validity\_start | 01Oct2013 00:00 | 01Oct2014 00:00 | 01Oct2013 00:00 |  |
| pm\_validity\_end | 01Oct2013 00:00 | 01Oct2014 00:00 | 01Oct2014 00:00 |  |
| pm\_attend\_goal | 01Oct2013 00:00 | 01Oct2014 00:00 |  | 1 |
| pm\_attend\_limit | 01Oct2013 00:00 | 01Oct2014 00:00 |  | 2 |

Make sure POSITION+PMM qualification have been updated for all crew that may act as PM Mentors.

Possibly enable/disable rules and/or cost functions described below.

## Rules / cost function

### Rule pm\_nbr\_matching\_pmm

Each PM activity is checked so there is exactly one matching PMM activity. “Matching” means that they have the same start and end time, and the preceding flight legs are “equal”, that is concerning the same flight.

Active: Studio, Pairing (optional), Rostering, Tracking

Purpose: make sure that there is a mentor present when there is a student, and also, check that the pairing structure is reasonable correct. Will detect for instance if in tracking, the meeting is move in time for one crew but not all, or other such cases, but also help the manual planning of PM trips and meetings.

Controlled by: Rules ALL RULES / PM: There is no mentor activity matching this PM meeting

### Rule pm\_nbr\_matching\_pm

Each PMM activity is checked so there is at least one matching PM activity. “Matching” means that they have the same start and end time, and the preceding flight legs are “equal”, that is concerning the same flight.

Active: Studio, Pairing (optional)+ Rostering+ Tracking

Purpose: make sure that there is at least one student present when there is a mentor, and also, check that the pairing structure is reasonable correct. Will detect for instance if in tracking, the meeting is move in time for one crew but not all, or other such cases, but also help the manual planning of PM trips and meetings.

Controlled by: Rules ALL RULES / PM: There is no student activity matching this PM meeting

### Rule qln\_pm\_mentor \_CC

Each assigned PMM activity is check to have a crew assigned with the PM Mentor qualification.

Active: Studio(+Optimizer), Rostering+ Tracking

Purpose: make sure that there is a qualified mentor assigned for PM activites.

Controlled by: Rules CC Xxx / Qualification Rules / PM: Crew should have mentor qualification for PMM

### Rule pm\_goal\_not\_attended\_CC

If the planning period is the last in the validity period, and crew is supposed/allowed to participate in PM (=Cabin crew in SKS, SKD or SKN regions), the number of attended PM activities in the validity period is counted (using accumulator). If this values is less the pm\_attend\_goal, the rule will fail.

Active: Studio, Rostering+ Tracking

Purpose: make sure that the PM program is fulfilled for all crew.

Controlled by: Rules CC Xxx / Training Rules / PM: not enough PM activities attended in validity period

### Rule pm\_limit\_exceeded \_CC

Each PMM activity is checked so there is at least one matching PM activity. “Matching” means that they have the same start and end time, and the preceding flight legs are “equal”, that is concerning the same flight.

Active: Studio, Pairing (optional), Rostering, Tracking

Purpose: make sure that there is at least one student present when there is a mentor, and also, check that the pairing structure is reasonable correct. Will detect for instance if in tracking, the meeting is move in time for one crew but not all, or other such cases, but also help the manual planning of PM trips and meetings.

Controlled by: Rules CC Xxx / Training Rules / PM: too many PM activities attended in validity period

### Cost pm\_distribution

For each crew, a cost is calculated as the square of number of attended PM activitities in the validity period, included the planning period.

Active: Optimizer Rostering.

Purpose: to give a reasonable even distribution of the meetings to the crew. The cost is higher if one crew has two meeting, than if two crew has one meeting each, etc.

Controlled by: Rules Roster Cost / 7.9 Uneven PM distribution

## Possible but not checked rules

* There should be two preceeding legs, prior to the meeting.
* The length of the meeting, and “connection time” etc.
* Only SKS, SKD and SKN crew should be available for assignment of PM assignment.
* Any fairness in assignment of mentors.

## Filters /reports in studio

### Filters PM mentors

Crew in plan with PM mentor qualification (POSITION+PM).

Menu: Assignment general / Filter / Instructors / Cabin Crew / PM filter

### Filters Crew with no PM activities

Crew in plan with no PM activities in the current validity period.

Menu: Assignment general / Filter / Recurrent / Not had PM

### Filters Crew with not enough PM activities

Crew in plan with PM activities in the current validity period, but number not reaching the goal.

Menu: Assignment general / Filter / Recurrent / Not enough PM

### Report crew

Show number of PM activities and time for last per crew. A new section “Miscellaneous”.

Menu: Crew object / Properties …

# New-Hire Follow up

New-hired pilots should perform a number of follow up flights after they have completed their ILC. These follow up flights should be performed under supervision of a designated mentor. The mentor should be the pilot that supervised the new-hired pilots ILC.

The follow up flights should be scheduled within the following intervals:

Follow up flight 1: 2-3 months after performed ILC

Follow up flight 2: 5-6 months after performed ILC

Follow up flight 3: 8-9 months after performed ILC

The follow up times are calculated from the turn of the month after ILC.

The New-hired pilot is automatically assigned a mentor and a follow up need within the intervals where he/she should have performed the follow up flights, when a valid ILC has been performed. This information is stored in the database table new\_hire\_follow\_up.

The table may be modified in the Table Editor to change the designated mentor or the intervals where the new-hire pilots should have its follow up flights.

## Assignment

The first two new-hire follow up trips should be at least two day trips. The third follow up trip may be any trip.

New-hired pilots follow up trips are assigned on position 2 using:

Trip object > Assign Training with Attribute

The designated mentor is assigned as normal on position 1. The new-hired pilots designated mentor must be assigned on the same trip as the new-hired pilot that has a follow up activity.

## Filters and reports

To find crew that must have a follow up flight scheduled this planning period, use the filter:

Assignment General > Filter > Training > Needs new hire follow up

A report is available that show information about all new-hired crew that is qualified for a follow up flight in this planning period. The Report is named *NewHireFollowUp.py*

## Legality

Legality regarding new-hire follow up flights is handled by the rules: *trng\_new\_hire\_follow\_up\_scheduled\_whithin\_interval\_FC*, *trng\_new\_hire\_crew\_has\_performed\_follow\_up\_FC* and *trng\_new\_hire\_follow\_up\_trips\_must\_have\_layover\_FC*.

The composition rules for new-hire follow up flights are handled as described in chapter 6.1.1.