CTI Constraint Technologies

TPAC Rostering

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TPAC™ Rostering is part of the TPAC™ suite of crew planning tools. Its objective is to create legal, workable rosters that cover all of the work to be done at minimum cost. **TPAC™ Rostering** is very flexible and deals with complex business rules, safe working requirements (including fatigue), workplace agreements and technical requirements.

How is TPAC Rostering used?

TPAC™ Rostering has been designed to handle all rostering requirements for a transport enterprise including:

- Crew pairing allocation
- Leave allocation
- Training allocation
- Standby/reserve duty allocation
- Day off allocation

Allocation can follow strict precedence, or use fair share algorithms to allocate a (weighted) fair share of activities. To support this, **TPAC™ Rostering** incorporates a number of solvers:

- Construction Solver: designed for speed and coverage. This solver is typically used to ensure that basic rostering requirements such as stand-by and leave levels are met.

- Sequential Solver: allocates activities to crew in a strict sequential order. This solver is typically used in a situation where staff bid for activities, and strict rules govern priority when awarding bids.

- Preferential Fair Share Solver: allocates activities so as to maintain a fair share of work between crew. The definition of "fair" is configurable, and can incorporate elements such as staff seniority and crew preferences.

- Recency Solver: ensures that expiring staff skills are renewed through the allocation of standard activities or special training.

Each optimisation run incorporates a pipeline of any arrangement of these solvers, with selectable rules for each pass. Manual roster allocations and deallocations may be performed at any stage to cater for special requirements.

The user can change rules (legal or otherwise) to produce an experimental "what if" solution that can be compared to the current set of rules.
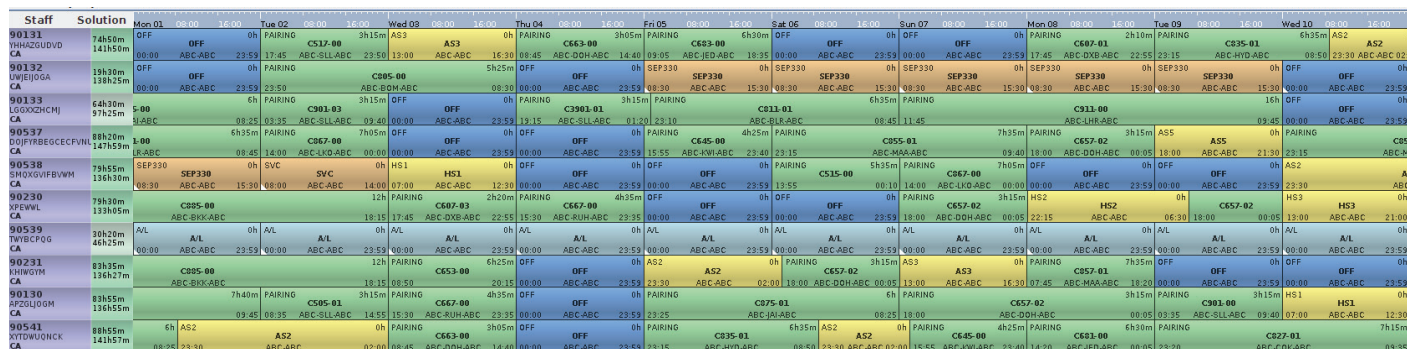
Advantages of TPAC Rostering

The TPAC™ Rostering Optimiser has the following advantages:

- Rules and objectives are dealt with simultaneously providing the lowest cost "legal" roster.

- Work can be fairly distributed both on the day and averaged over time.

- Non-productive activities can be scheduled to minimise impact and cost.

Our optimisers are suitable for large problems that are made up of thousands of staff.

Fig.1 *A view of crew rosters in TPAC™ Workbench, with crew allocations displayed according to the activity's start/end times.*

Fig.2 *A view of crew rosters in TPAC™ Workbench, with crew allocations displayed in "full day" format.*

Fig.1 *Comparing multiple roster solutions in TPAC™ Workbench, with a user-configured theme.*