



## Fire Program Analysis – Preparedness Module Optimization – Input Data Compression

Date: May 26, 2004

### Topic: Reduction in the number of fire resources used in the optimization routine of FPA PM. (Model Fire Resources)

**Issue:** Input Data into the optimization routine needs to be reduced as part of a larger effort to improve functionality and performance of the optimization routine.

**Background:** As the optimization routine is being developed, it is apparent that due to software and hardware constraints associated with the model the amount of data input to the routine must be reduced to assure that accurate assessment of initial response workload will occur. The reduction in input data to the optimizer must maintain the integrity of the initial response analysis by considering viable fire resource options. The following input data is an attempt to meet these goals.

### Solutions:

- **Engine Typing:** Type 1 and 2 engines are structural apparatus and not wildland engines and therefore will not be used for analyzing the wildland fire program. The contributions of Type 1 and 2 engines could be modeled, if necessary, by inputting them to the system as Type 3.
- **Type 7 engines:** These are considered a patrol vehicle and **will not be analyzed.**
- **Engine Type Table:** Engine type in column 1 represents Engine Types that currently exist in the inventory of the Fire Planning Unit. FPA PM will assess existing engine types as well as engine types above and below those types in the existing inventory. If a unit has only Type 4 engines in its current inventory, the model will assess Type 3, 4 and 5 engines in the analysis. If a unit has Type 4 and 6 units in its inventory, the model will try Type 3, 4, 5 and 6 engines. Existing fire resources are assumed to be an effective starting point based on field experience. This allows a reduction in the number of resources that need to be considered in the analysis.

Engine Type Existing	3	4	5	6
3	X	X	X	
4	X	X	X	X
5		X	X	X
6		X	X	X

## Staffing

- **Staffing Increments:** Don't use unlimited staffing increments in determining number of people being deployed. The assumption is that vehicle capacity is considered. Example: Limit hand crews to specific numbers based upon transportation capacity. i.e. a standard cab pickup may consider 3 or 2 people staffing, the six-pack vehicle may consider staffing of 3 and 5 instead of 2, 3, 4, 5 and 6, etc.
- **Resource Staffing Table:** The following table includes the recommended staffing levels based on input from representative field units.

Category and Type	Included as part of resource	2	3	5	10	20
Engine Type 3			X	X		
Engine Type 4			X	X		
Engine Type 5		X	X	X		
Engine Type 6		X	X	X		
Crew Type 1						X
Crew Type 2			X	X	X	X
Dozer Type 1	Operator/Boss					
Dozer Type 2	Operator/Boss					
Dozer Type 3	Operator/Boss					
Tractor/Plow	Operator					

**Limit Resources Base on Travel Time:** Limit resources from Dispatch Locations to respond to ignitions associated with a workload point that is within a reasonable travel time for initial response (circle of influence). This delay time should be a global setting and not left to individual users. The restrictions suggested by representative field units has been anywhere from 1 hour to 6 hours and has a bias based on Geographic Area level. The suggested approach is for a minimum response time of 4 hours nationally with the Geographic Area determining the upper limit for response time.

**Conclusion:** Implementation of these solutions will increase the functionality and performance of the optimization routine in FPA PM.