Asprova's "Pocket manual" series No.11

Yield per resource

Here's an example of how to program when yields differ for each resource

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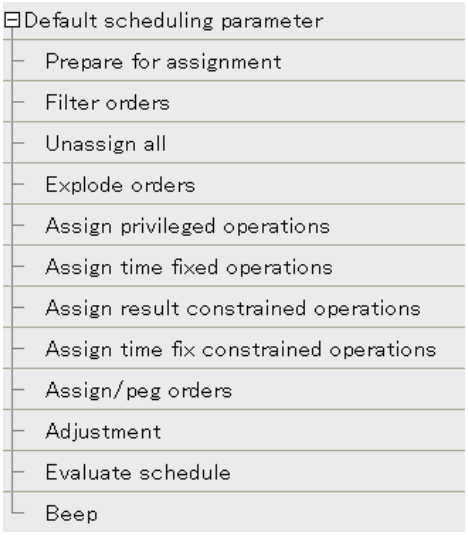
Why it's not easy to get the same yield for each resource

The Integrated master table contains "Yield rate" property and if we assign a forecast yield, inferences can be made in the plan to yield during material requirements calculation (commonly called order explosion in Asprova) (see Fig 1). However, "Yield rate" Integrated master table is assigned to the Master input instruction and the Master output instruction. If there is more than one candidate resource in the same process and if yield differs for each resource then the yield goals cannot be achieved without modification. Why is this so?

This can be explained using the example of the "Default scheduling parameter" (See Fig. 2). Rescheduling is executed in the step sequence "Unassign"→"Order explosion"→"Assign". The requirements explosion that makes reference to yield is the "Order explosion command." The allocation process is conducted and then, after that, resources are decided on via a dummy allocation process. In other words, requirements must be exploded during the order explosion and in a state in which resources are still not decided. The consequence is that we cannot make reference to resources that are dependent on yield.

	Item	Process number	Instruction type	Instruction code	Resource /Item	Scrap quantity	Yield rate
15		25	Input instruction	In	A-20	0	1
16			Use instruction	M	X		
17			Use instruction	S0	D		
18			Use instruction	M	Y		
19			Output instruction	Out	A-25	0	1

▲ Fig. 1 Integrated master table
Yield rate can be assigned but not to each resource.



▲ Fig. 2 Default scheduling parameter

Help

"Explode orders" (Help No.762000)
"Rounding quantities during order explosion"(Help No. 782500)
"Result and yield ratio/number of scraps"(Help No. 782550)
Additional explanations of assignment method and yield concept can be found in the practical training texts.

Deciding policy

Based on the reasons cited above, to achieve yields dependent on resources, first enter the status in which a decision can be made on resources to be allocated in advance and then combine with planning parameters for order explosion. The general steps for execution are shown below.

1. Unassign
2. Order explosion (without reference to yield)
3. Assign
4. Unassign
5. Order explosion (with reference to yield)
6. Assign (to same resource in phase 3)

The first of the two order explosions (2 and 5) does not take yield into consideration, while the second must. The expression for calculating volume determines whether this is the first time or not and requires that the calculation be made by a different expression. Consequently, this is necessary in order to know what is running

right now, whether the process is the first (1～3) or the second (4～6) that is now executing. This embeds a flag in the planning assignment and refers to the flag within the calculation expression to determine if the processing going on is that of the first or the second section.

Let's look at the assignments

First, add a numeric property to the resource class to assign Yield rate for each resource (see Fig. 3). The Integrated master table's "Yield rate" will not be used.
A numeric property is also added to the Project class because it attaches, to the planning assignment, the flag that determines whether the process now running is the first or second process. Here the property is named "phase" and the value assigned to it is 1 if this is now the first phase, and 2 if this is now the second phase.

	Resource code	Yield rate
1	X	0.67
2	Y	0.8
3	A	1

▲ Fig. 3 The "Yield rate" property added to Resource class

Project Settings

Property	Value	Description
⊟Project	Project	
Phase	1	1:Without reference

on | Fix | Calendar | Log | User | Common | Internal | All properties

▲ Fig. 4 Adding numeric property "Phase" to Project setting

The planning parameters are now set as shown in Fig. 5. The "Set flag to 1" and "Set flag to 2" parameters will run at the beginning of data for rescheduling the first and the second schedules and the "Modify properties" command is embedded within them. The Phase, as shown in Fig.5, at that time will be set in the planning assignment of the Modify properties command.

Scheduling parameter table

	Code	Generic expression
36	⊟Assign and calculate qty from assigned r	
37	⊟Phase1	
38	⊟Set flag to 1	
39	Modify properties	PROJECT.Phase=1
40	⊞Default scheduling parameter 1	
41	⊟Phase2	
42	⊟Set flag to 2	
43	Modify properties	PROJECT.Phase=2
44	⊞Default scheduling paramter 2	

▲ Fig. 5 The planning parameter. As can be seen, the two phases are such that with the Modify properties command, the phases (Phase 1 and Phase 2) will be assigned to the Project setting.

※ The "Generic expression" property is a property that was added beginning with Ver.5.3.0. In versions prior to 5.3.0, assigning an expression the same as this to the "Order expression" would yield the same result. However, if the "order expression" alone were used in such instances, the processing would execute once for each order. Any effect on processing speed will be minimal, but for those who may be concerned, use the "Filter orders" property for proper filtration of orders and insert it in front of the "Prepare for assignment command" and the "Filter orders command."

Help
"Adding new property definition" (Help No.743210)
"Expressions" (Help No.741000)
"Modify properties command" (Help No.778300)

The "default scheduling parameter 1" and the "default scheduling parameter 2" that execute after phases are set in Project settings and are almost the same as the "default scheduling parameter"; the only point of difference being that the "default scheduling parameter 2"'s "Resource selection method" property is assigned to "Current resource." That is because it reallocates to the same resources as those allocated when the parameter is "default scheduling parameter 1".

The Integrated master table assigns the quantitative calculation expression that refers to whether or not Yield rate is considered in line with Phase (see Fig. 7). Let's turn our attention to a more detailed view of the expression's content. Fig. 8 is the "Production qty formula." The if statement is used to differentiate between using the Yield rate in the Integrated master table or acquiring the operation from allocated resources according to what the phase is.

Property	Value
⊟Default scheduling paramter 2	Default scheduling para
Dispatching rule	ME.Work_Order.Order_P
⊞Resource evaluation (1)	Default resource evalua
Assignment type	Finite capacity
Assignment direction	Forward
Resource selection method	Current resource
Temporary operation fix	None

▲ Fig. 6 Second planning parameter
The "Resource selection method" is assigned to "Current resource".

	Item	Instruction code	Resource /Item	Output qty formula	Production qty formula
15		In	A-20		
16		M	X		
17		S0	D		
18		M	Y		
19		Out	A-25	Truncate(I	Roundup(I

▲ Fig. 7 Integrated master table. Customizing the Output qty formula and Production qty formula.

```
Roundup(If(PROJECT.Phase==1,
(ME.Quantity/ME.'Master output instruction'.'Yield rate'+
 ME.'Master output instruction'.'Scrap quantity')/
 ME.'Master output instruction'.'Required quantity',
(ME.Quantity/ME.Operation.'Main resource'.'Yield rate'+
 ME.'Master output instruction'.'Scrap quantity')/
 ME.'Master output instruction'.'Required quantity'),0)
```

▲ Fig. 8 The production qty formula

If the Phase is 1, use the Master output instruction's yield rate (i.e., the Integrated master table's yield rate) and if the Phase is 2 use the Yield rate from the Main resource allocated by the operation.

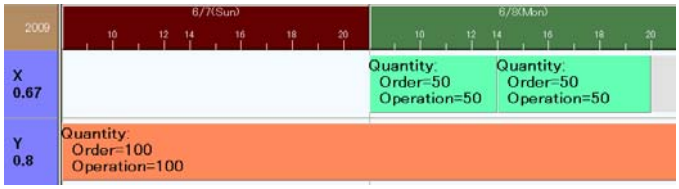
Help

"Assigning an operation to the resource to which it is currently assigned"(Help No. 466000)
"Composite scheduling"(Help No. 778000)

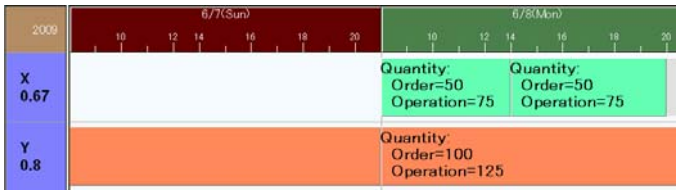
Let's try it

We will first attempt to run "Phase1" of the planning parameter known as "Assign and calculate qty from assigned resource yield rate" (see Fig. 9). The required volume explosion is executed without consideration to the "Yield rate" of each resource and is allocated without modification. The Modify properties command will assign 1 to the "Phase" property of the Project setting at this time.

Next we attempt to run "Phase2" (see Fig. 10). The required volume is exploded giving consideration to the "Yield rate" of each resource, and Production quantity for the operation is calculated according to the "Yield rate" of each resource.



▲ Fig. 9 The Gantt resource chart after the first execution of reschedule
The numbers 0.67 and 0.8 below the resources are the Yield rates for each resource (Resource left part text expression).



▲ Fig. 10 The Gantt resource chart after the second rescheduling run. The required volume is exploded giving consideration to resource Yield rate so that the operation's Production quantity is greater than the order's "Order quantity".

Help

"Use instruction bar text"(Help No. 670600)

For more information

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