

# SchedulePro 9 Enhancements

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## Text File Import/Export Improvements

There is new support for importing and exporting SchedulePro data through tab-delimited text files.

## Recipe Import/Export

New fields include:

- RECIPE DESCRIPTION
- Expanded duration fields: DURATION TYPE (Includes duration types and fields for support of master-slave)
- REPORT TEXT and REPORT HIGHLIGHT
- IGNORE OUTAGES and IGNORE OUTAGE IF STARTED
- New staff properties including HAS MAX STAFF HOURS, MAX STAFF HOURS, STAFF BY SKILL, SKILL.
- UTILITY, UTILITY AMOUNT, UTILITY units

## Staff Import/Export

Staff resources may be imported and exported.

## Labor Import/Export

Labor resources may be imported or exported.

## Utilities Import/Export

Utilities resources may be imported or exported.

## Recipe Streams Import/Export

Recipe material streams may be imported or exported.

## Outage Export

Resource outages may be exported as well as imported.

## Staff Working Hours Limits

SchedulePro now provides for a soft limit for staff working hours. This constraint is defined in the recipe at the operation level.

In the example below, SchedulePro will avoid assigning staff that have worked more 14 hours or more over the 2 days preceding the operation.

Labor	Heating/Cooling	Power/Duty	Material Inputs	Material Outputs
General	Duration	Scheduling	Auxiliary Equipment	Transfer Panels
Staff				

Staff Assignment for Startup in Process

Available

New Facility

Included

✕ ✗ ↑ ↓ ↕ ↕

Day1 (in New Facility)

Day2 (in New Facility)

Day3 (in New Facility)

Day4 (in New Facility)

Use  persons Use All

Consider Skills       Avoid Assigning Staff to this Operation if the staff has worked:

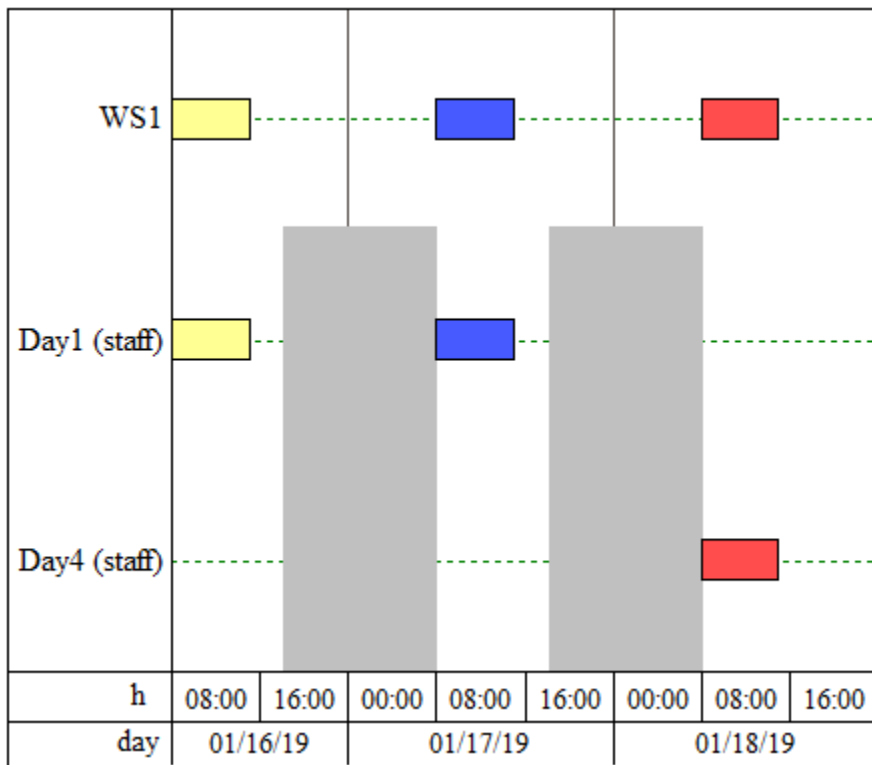
Filter Available Staff for Skills      Max Working Time  h

Staff by Skills      Over a span of  day

Before the start of this operation

Skill Requirements

The resulting schedule is shown below:



The Day 4 staff is assigned to the operation in Batch 3 (red) even though the Day1 staff is available. If Day1 is the only available staff it will be assigned without signaling any conflict.

This may be set through the recipe file upload.

The recipe upload/output has the following new fields:

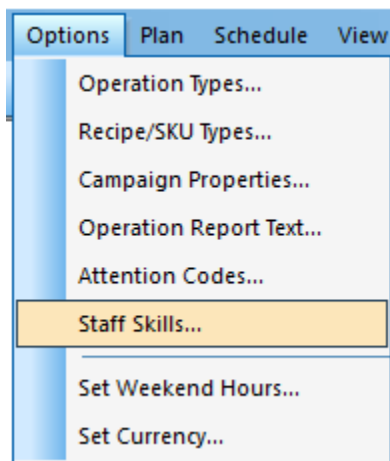
HAS MAX STAFF DUR – (TRUE/FALSE) – Turn the feature on/off.

MAX-STAFF\_SPAN\_HOURS – The elapsed time over which to measure the staff usage.

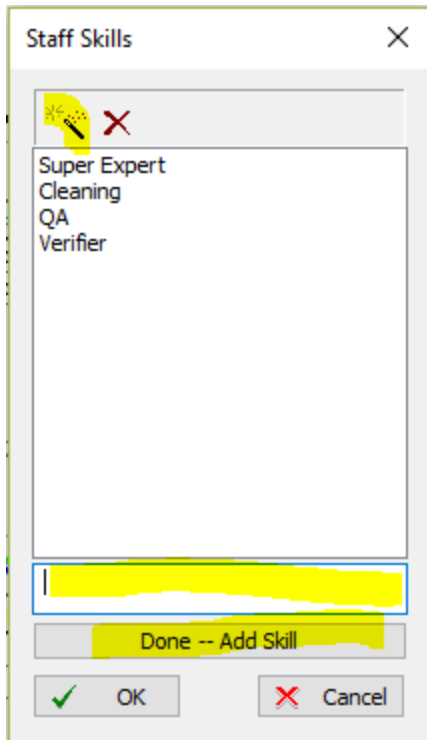
MAX STAFF HOURS – The maximum working duration for the staff.

## Scheduling Staff by Skills

Staff skills are defined at the global level.

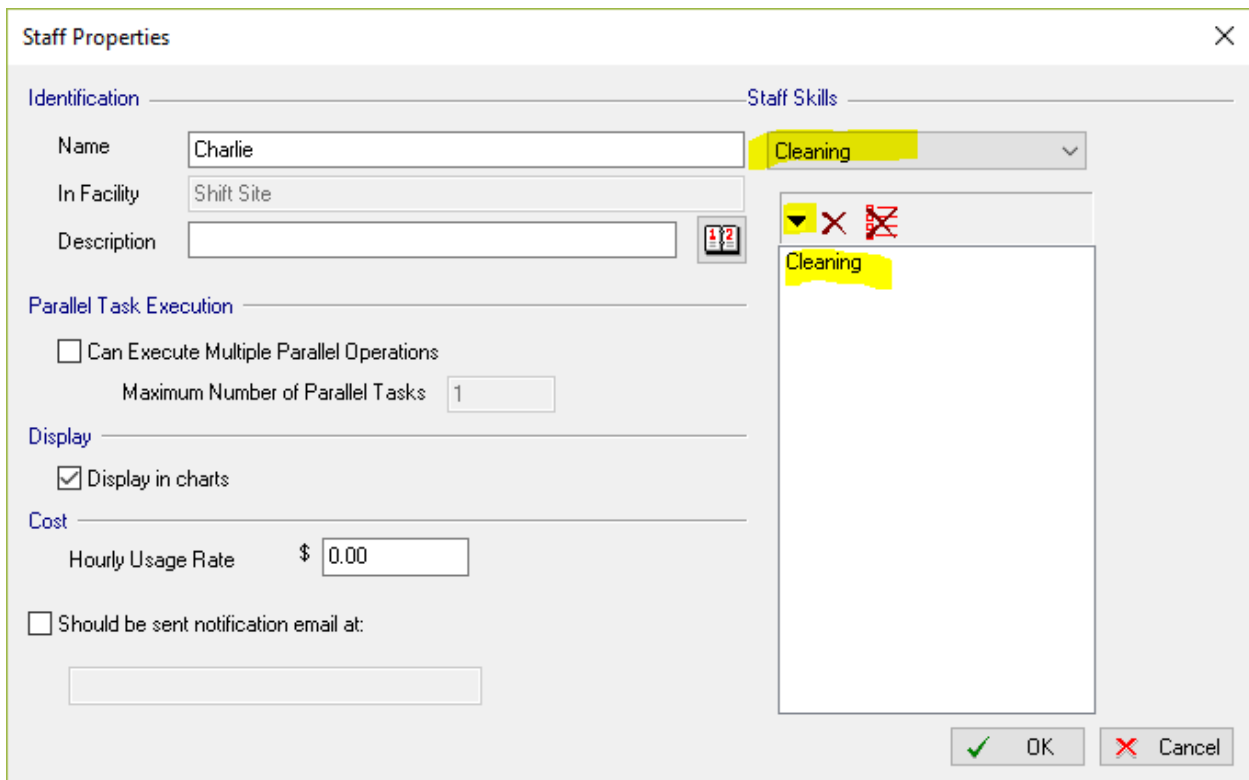


Select Options >> Staff Skills...



The magic wand button adds a new skill. Enter the skill name and click “Done” to add the skill to the list.

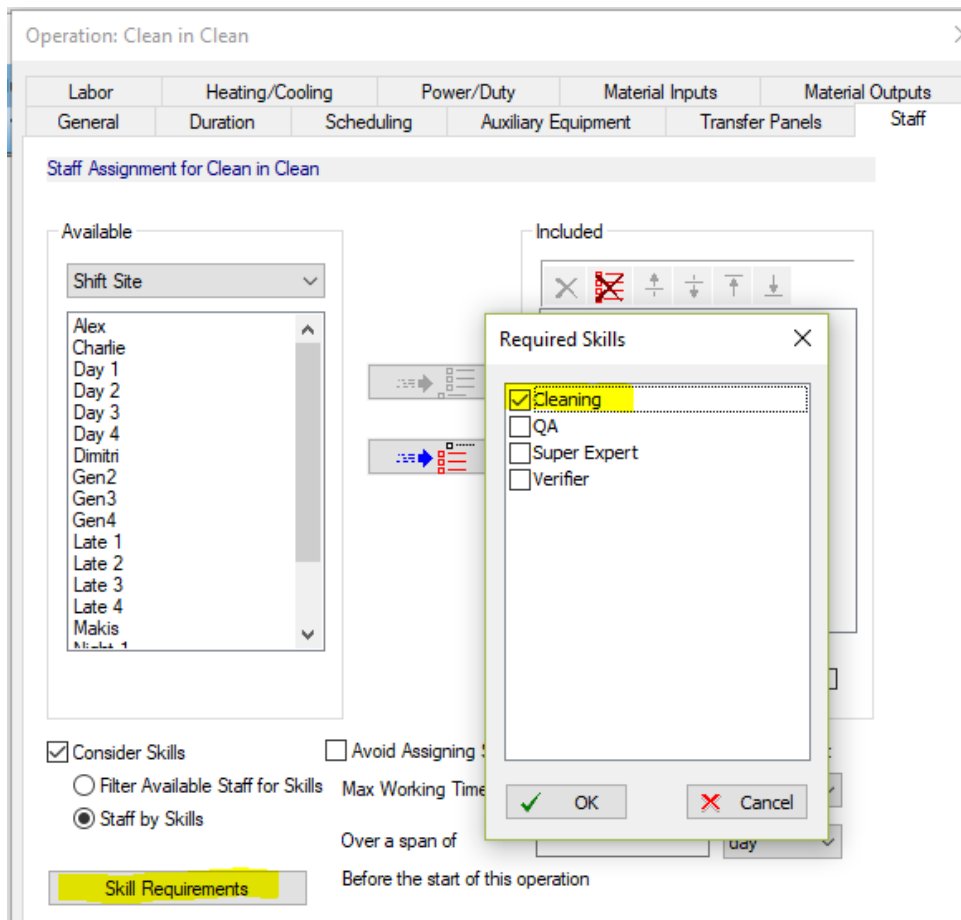
Skills may be assigned to staff.



Select the skill to be added and click the down arrow to add the skill.

If a skill is deleted from the global list, it will be deleted from all staff and operations.

Skill requirements are defined at the operation level.



To use skills, check consider skills and click the Skill Requirements button.

Check the skills required for the operation and click OK.

The skill requirements may be used as a filter for the Available Staff list. In this case, simply assign the staff as usual.

If the Staff by Skills option is checked, the staff list is essentially ignored, and the staff pool is created by searching for all the staff in all facilities that have the required skill.

Note 1: even if the staff by skills option is selected the included staff list should include at least as many members as are listed in the Use – persons box.

Note 2: If no staff has the combination of skills, the process cannot be scheduled. It is a good idea to filter to check.

Note 3: If skills are added or removed from staff, you may need to reschedule future batches.

Staff skills may be uploaded through the staff upload file.

Two new fields have been added

SKILL – the skill to be added

APPEND – (TRUE/FALSE) If TRUE for the first row in which a given staff member appears, all the skills for that staff will be added to any existing skills for that staff.

## Staff Load Leveling

If the staff-by-skill feature is used the qualified staff for an operation are ordered by number of skills then by assigned hours.

## Key Date Reporting

Key dates may be defined for specific operations in a recipe.

For any operation choose whether its start or end is a key date and what the respective headings should be.

Operation: Day 0 Process Start in Day 0 WS

Labor	Heating/Cooling	Power/Duty	Material Inputs	Material Outputs	
General	Duration	Scheduling	Auxiliary Equipment	Transfer Panels	Staff

Operation: Day 0 Process Start

Procedure: Day 0 WS

Section: Production

Branch: Main Branch

Recipe: Mod 5

Operation-Type (Optional): Process

Conditional Scheduling:

Reporting Information

Description:

Include in Activity Report  Highlight in Activity Report

<operation>

Use the following substitution symbols: <batch>, <procedure>, <operation>, <main equip>, <aux equip>, <staff>, <description>, <comments>, <recipe>, <sku>

Is Start Key -- Heading Text: Day 0 Start

Is End Key -- Heading Text:

The recipe or document should be exported to the SQL Server database.

In the Web Viewer, select Key Dates Report.

SchedulePro WebViewer

Campaign Reports Gantt Chart Equipment Occupancy Chart Storage Unit Inventories Schedule Report Activities Report **Key Dates Report**

Set Date From  Set Date To

01/08/2019 12:45 PM  01/28/2019 9:30 PM

Today  Days To

**Select Task Display Level**     Dataset     Campaign     Batch

Dataset: Novartis TEST Jan    Campaign: MP10X1    Batch: MP10X1

KeyDates ▾

Campaign Name	Batch Name	Day 0 Start	Wave Seed	Harvest Start	Pack/Ship End
MP10X1	MP10X1	1/8/2019 7:45:00 AM	1/17/2019 6:00:00 AM	1/18/2019 6:00:00 AM	1/28/2019 4:30:00 PM
MP10X4	MP10X4	1/9/2019 7:45:00 AM	1/18/2019 6:00:00 AM	1/19/2019 6:00:00 AM	1/29/2019 4:30:00 PM
MP10X7	MP10X7	1/10/2019 7:45:00 AM	1/19/2019 6:00:00 AM	1/20/2019 6:00:00 AM	1/30/2019 4:30:00 PM
MP10X10	MP10X10	1/11/2019 7:45:00 AM	1/20/2019 6:00:00 AM	1/21/2019 6:00:00 AM	1/31/2019 4:30:00 PM
MP10X13	MP10X13	1/12/2019 7:45:00 AM	1/21/2019 6:00:00 AM	1/22/2019 6:00:00 AM	2/1/2019 4:30:00 PM
MP10X16	MP10X16	1/13/2019 7:45:00 AM	1/22/2019 6:00:00 AM	1/23/2019 6:00:00 AM	2/2/2019 4:30:00 PM
MP10X19	MP10X19	1/14/2019 7:45:00 AM	1/23/2019 6:00:00 AM	1/24/2019 6:00:00 AM	2/3/2019 4:30:00 PM
MP10X22	MP10X22	1/15/2019 7:45:00 AM	1/24/2019 6:00:00 AM	1/25/2019 6:00:00 AM	2/4/2019 4:30:00 PM
MP10X25	MP10X25	1/16/2019 7:45:00 AM	1/25/2019 6:00:00 AM	1/26/2019 6:00:00 AM	2/5/2019 4:30:00 PM
MP10X28	MP10X28	1/17/2019 7:45:00 AM	1/26/2019 6:00:00 AM	1/27/2019 6:00:00 AM	2/6/2019 4:30:00 PM

KeyDates ▾

Mod 6

The report is organized by recipe and filterable by time.

Use the **Key Dates** menu to pick which of the defined key dates to show.

## Staff Email Notifications

The email notification feature allows staff to be notified when they are within a specified time of an upcoming assignment. This feature works with the database to ensure that notifications are not sent out more than once unless there has been an update in the assigned campaign.

### Setting Up the Email

Emails are sent from the SchedulePro user's workstation. Go to the SQL Server settings to enable the email feature. The following values depend the local email environment:

- SMTP – Server this is the email server
- PORT – the preferred port for the server
- USE SSL – check this if the server requires SSL email
- Username/Password – required to login when SSL is enabled
- Checking Interval – SchedulePro checks the database for new email notifications on this interval



SQL Server Settings



Enable SQL Server Features

Connection Type

Local (Shared Memory)

Network

Address localhost

Port

Static

1433

Dynamic

Instance Name SQLEXPRESS14

Authentication Type

Windows (Integrated)

Username/Password

Username

Password

Database

Database Name ScheduleProT

Check

Setup

Reconstruct

Fix IIS Rights

Drop

Export Settings

Dataset Name EmailTest

Look Up

Add Comments On Export

Enable Emailing

SMTP Server smtp.intelligen.com

Port

587

Use SSL

Username casiletti@intelligen.com

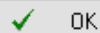
Password

●●●●●●●●●●●●●●●●

Checking Interval (Minutes) 20

Back to Defaults

Copy Connection String

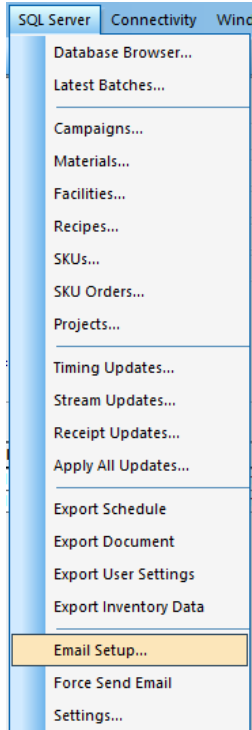


OK



Cancel

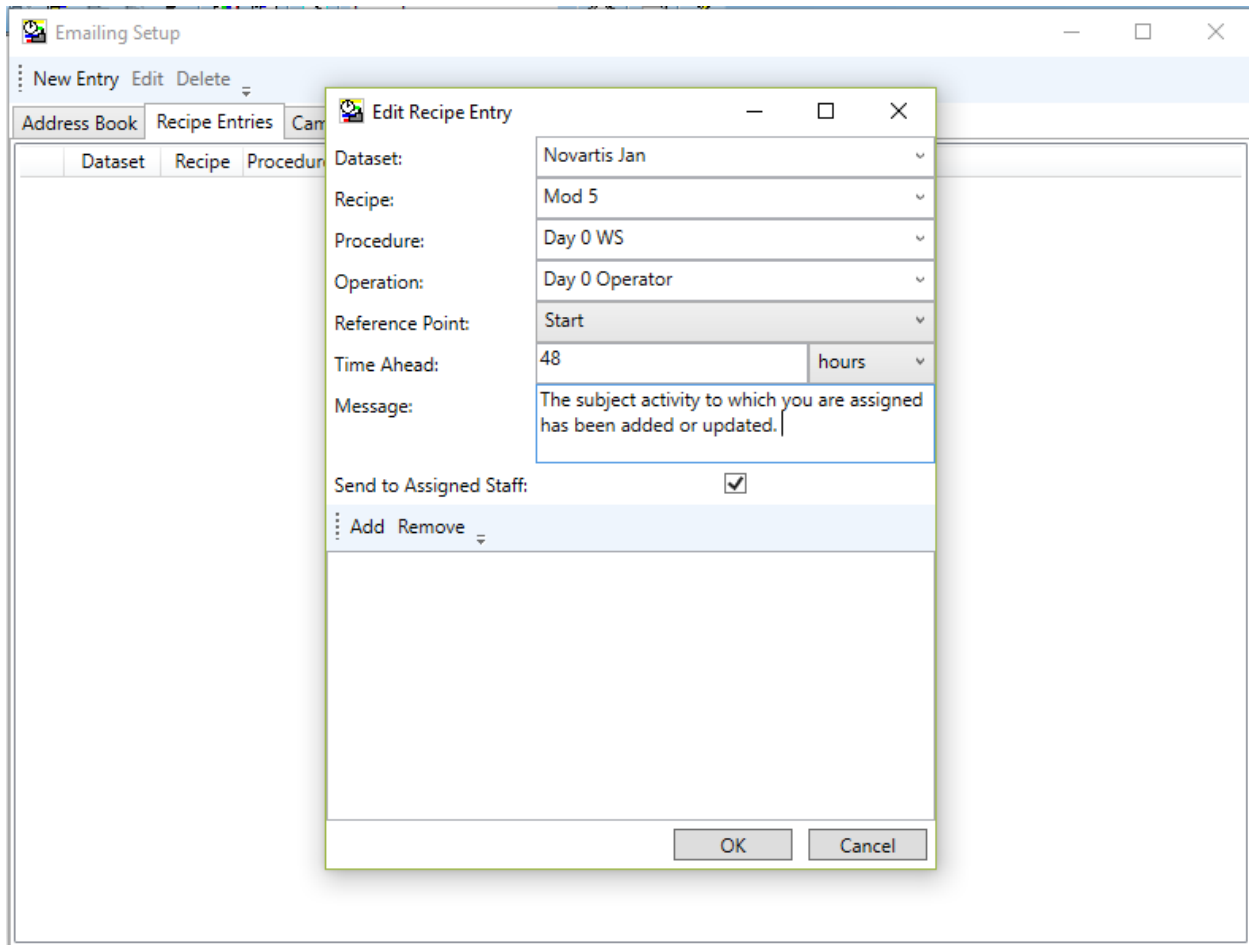
## Configuring the Email Settings



SchedulePro will use the email address field from staff resources. In addition, a set of contacts may be defined for additional notifications in the Address Book section of the Email Settings.

Use the *Recipe Entries* tab to define which activities will be notified by email. Be sure that the recipe has been exported to the database. The following fields are required:

- Dataset – This is the dataset defined in the SQL Server settings.
- Recipe – The recipe
- Procedure – The procedure within the recipe
- Operation – The operation within the procedure.
- Reference Point – Whether the start or end of the produce should be considered when sending the emails.
- Time Ahead – This defines how soon before the reference point the email will be sent.
- Send to Assigned Staff – Check this box to have the email alert sent to any staff assigned to the operation.
- Additional Contacts – Any other email addressed to which the message should be sent.



Normally at each checking interval, SchedulePro will check for new database updates and send the corresponding notifications. Alternatively, the SchedulePro user may choose SQL Server >> Force Send Email. This will immediately check for updates that need notification.

## Campaign Level Scheduling Mode

The Scheduling mode may be set separately for each campaign.

## Variability Analysis Improvements

New statistics are available for variability analysis:

- Makespan (original)
- Total cost
- Average Lateness (with respect to due date)
- Late Batch Count
- Conflict count

## Zero Duration Operations

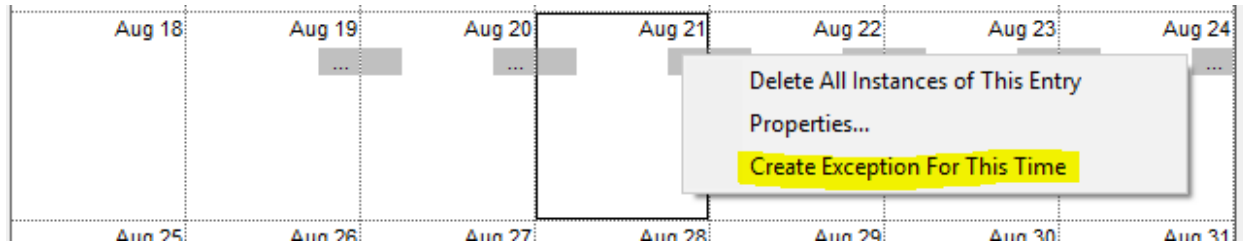
SchedulePro now allows zero-duration operations (with a warning).

## Completion Status Propagation

When setting the status of an operation, there is an option to automatically propagate the status to the predecessor operations. An operation must depend on its predecessors and must be later than them.

## Exceptions for Repeating Outages

SchedulePro allows for breaks in a repeating outage.



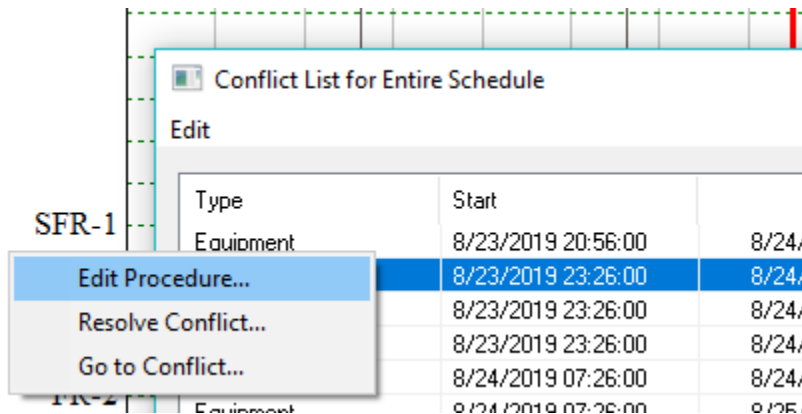
## Apply Outage Calendar to Selected Resources

In the resource list view, the resource right-click menu provides the option to apply the outage calendar of the selected resource either to all the other resources or to a selected list.

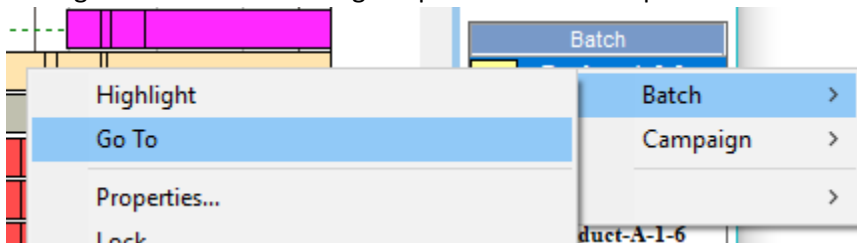
## EOC Search/Go-To Improvements

The behavior of the Go To tool in the Equipment Occupancy Chart is improved.

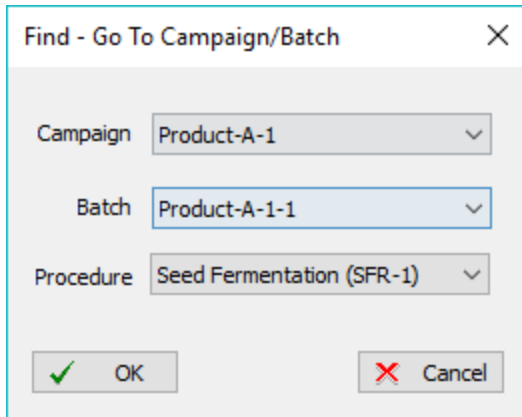
There is a Go-To feature in the View-Conflicts list.



The right-click menu in the legend provides a Go-To option.

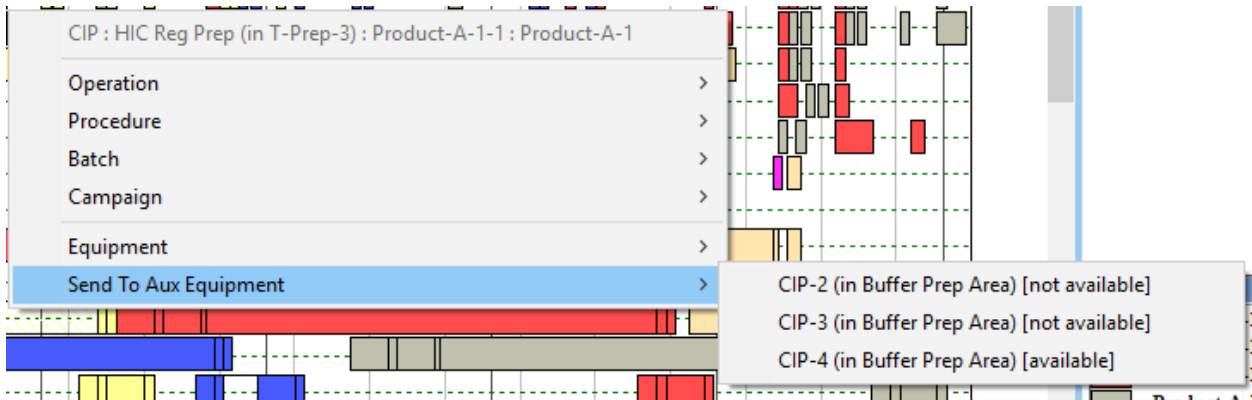


When chosen, the legend Go To option presents a selection of possible procedures to find.



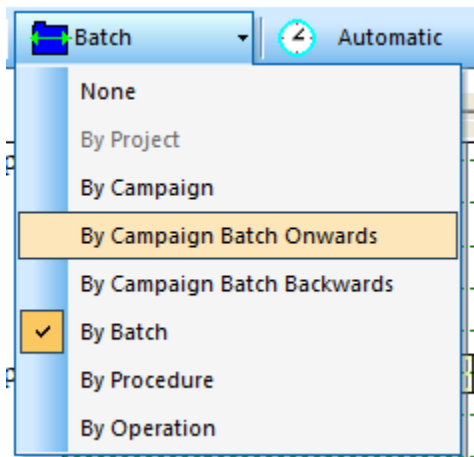
## EOC Send-To Resource Improvements

The send-to staff/equipment option now indicates the availability of the alternative resources and presents them in alphabetical order.



## EOC Allow Drag/Drop of Partial Campaign

SchedulePro now allows the drag-and-drop rescheduling of all the previous or subsequent batches in a campaign.



## SKU Scheduling Allows Co-Products

By products may be introduced into the Bill-of-Materials of an SKU.

The screenshot shows a window titled "SKU: AA-Int-2" with a "BOM" tab selected. It displays the production quantity and unit for "AA-Int-2" and a list of required SKUs.

To produce   of 'AA-Int-2',  
the following quantities of SKUs are needed as inputs:

SKUs  Materials

SKU/Material	Amount	Units
AA-Int-1	280.00	kg
RM-3	144.00	kg
By-Product (Co-Product)	60	kg

Buttons: OK, Cancel, Help

## SKU Lead Time for Intermediate in SKU Order

SchedulePro can now add lead time for planning intermediate SKUs.

The screenshot shows a window titled "Step 1: Confirm Order" with the following details:

Order Template:

Set SKUs and Amounts in Order

SKU	Amount	Units
AA-API	1700.00	kg

Release Date:

Due Date:

Lead Time for Intermediates:

Buttons: Cancel, Next >>

## Procedure Prefer to Keep Equipment Option

Procedures now have a new option to “Prefer the Same Equipment” as another procedure. This is a less stringent condition than “Must Use the Same Equipment as Procedure.” The preferred equipment is selected only if it is available. The user may assign differ equipment to scheduled procedures.

Procedure Details for Fermentation

Properties Main Equipment Pool Work Area Pool Scaling

Facility  
Upstream Facility Match Type  Fementor

Shares Equipment Pool with Procedure  
 Must Use the Same Equipment as Procedure  
 Prefer the Same Equipment as Procedure  
 Do not Share Equipment with Other Procedures  
 Require Staggered Use of All Equipment  
 Require Same Equipment for Entire Campaign

Seed Fermentation

Available Equipment  
FR-3  
FR-4

Equipment in Pool  
FR-1 (in Upstream Facility)  
FR-2 (in Upstream Facility)

OK Cancel Help

## Storage Unit Planning

When intermediates are planned with materials rather than SKUs, use the Storage Unit Planning tool to view a balance of the stored materials. This will account for scheduled and/or unscheduled campaigns.

Storage Unit Planned Use

Edit

Show Unscheduled  Show Scheduled

Storage Unit	Units	Opening Inv	Planned Demand	Planned Supply	Balance
INX Regen	L	0.00	23400.00	25000.00	1600.00

## Dialog Size Improvement

Large dialogs have been reduced in size to accommodate lower resolution monitors. There is a scroll bar to access the contents of these dialogs.

Operation: Charge Media in Seed Fermentation

Labor Heating/Cooling Power/Duty Material Inputs Material Outputs  
General Duration Scheduling Auxiliary Equipment Transfer Panels Staff

Estimated Total Nominal Duration 1.00 h

Duration Calculated (= Constant)

Constant 1.0000 h  Scales with Batch Size

Rate-based Term Setup...

Duration Equal to Another Operation or Sequence of Operations

In procedure

Seed Fermentation

Single Operation Match the Duration of this Operation

Set Up

Sequence of Operations Ending Operation in Sequence

Set Up

Duration Includes Breaks in Master Operation(s)

Duration Based on Inventory in Storage Unit Setup...

Duration Based on Main Equipment Cleaning/Changeover Times

Duration equal to equipment's

Setup/Pre-cleaning Time Changeover Matrix

Navigation buttons: << >> << >> OK Cancel Help