

Table of Contents

Version 11 Features	1
Staff Leveling	1
Scheduled Operation Editing Improvements	2
Scheduling Links Shown in Equipment Chart	3
Schedule Menu Restructured	4
Status Propagation for Completed Operations More Extensive	5
Campaign Navigation Improved	6
Equipment Used-By More Readable	6
Recipe Overview Dialogs are Sizeable	7
Recipe Editing in Gantt Chart	7
Operation Auto-Schedule now Optional	8
Equipment Chart Frame Coloring	8
Transfer Panel Alternate Equipment Compatibility	9
Recipe Navigation: Procedure Drill Down	10
Batch Message Management	10
Minimum Cycle Time for Event Based Campaigns	11
Transfer Panel Compatibility to Other Procedures	12
Version 10.3 Features	13
Equipment-Dependent Streams	13
Improved Cycle Time Estimate	13
Excel Report	14
All Reports Have Show on Exit Option	14
Equipment Staff Utilization Report Improvements	14
MS Access (MDB) Report Improvements	15
SQL Server Production Timing Update Improvements	15
Campaign Renaming for Campaigns in SQL Server	15
Sort Campaigns in Campaign List	16
Discrete Streams May Have a Bulk Quantity	16

Resource Charts May be Shown in Volume	17
ODBC Campaign Data Import/Export	17
Linked Conditional Operations	18
Improved Weekend Display	18
Outage Color	19
Material Holding Resources	19
Web Tracker 10.3 New Features	19
Gantt Chart Equipment Occupancy Page Display Options	20
Edit Tracking information in EOC.	20
Make Equipment and Staff Updates	21
Line Charts Include Material and Resources	21
Shift Notes	21
Version 10.1 New Features	22
Support for WebTracker 10.1	22
Multi-Select Operations in Procedure View	22
Improved Equipment Deletion	22
Improved Handling of Repeated Operation/Procedure Names	23
Improved Elapsed Time Measurement in EOC	23
V10.1 Bug fixes	23
Version 10 New Features	25
New Examples and Databases Location	25
New Examples Directory	25
Web Tracker Support	25
Multiple Inventory Plotting	26
Improved Continuous Processing Options	27
Improved Tracking Options	27
Attention Code Tracking	27
Limited Update Mode	27
Critical Path Display	28
Changed Operations	28
Equipment Chart Color-by-Procedure	29
Equipment Chart Time Measure	29

Campaign Scaling Limits In Recipe	30
+/- Flex Shifts	30
Share Staff with Other Operations	31
SKU Based Report Text	31
Phase ID / Phase Entry ID	32
QC Reporting	33
Ad Hoc Scheduling	33
Resource Editing Options	33
New Examples	34
Version 9.1 Enhancements	35
Save as Version 9.0	35
Added Work Area Usage Policies	35
Staff Status Designations	36
Version 9.0 Enhancements	36
Text File Import/Export Improvements	36
Staff Working Hours Limits	37
Scheduling Staff by Skills	38
Staff Load Leveling	40
Key Date Reporting	40
Staff Email Notifications	41
Campaign Level Scheduling Mode	43
Variability Analysis Improvements	43
Zero Duration Operations	43
Completion Status Propagation	44
Exceptions for Repeating Outages	44
Apply Outage Calendar to Selected Resources	44
EOC Search/Go-To Improvements	44
EOC Send-To Resource Improvements	45
EOC Allow Drag/Drop of Partial Campaign	45
SKU Scheduling Allows Co-Products	46

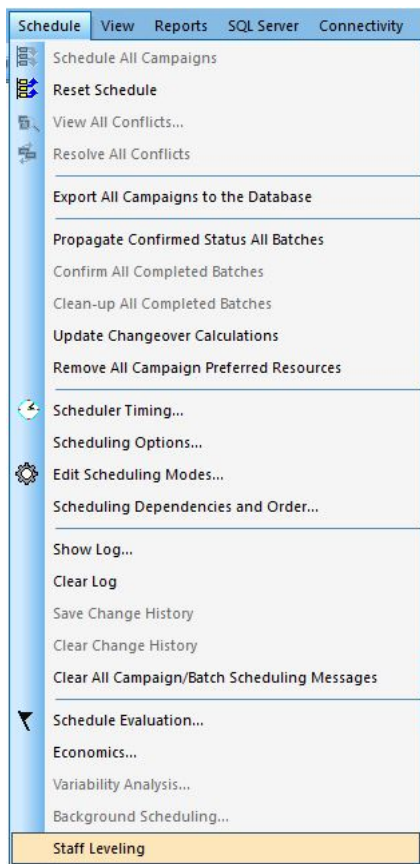
SKU Lead Time for Intermediate in SKU Order	46
Procedure Prefer to Keep Equipment Option	46
Storage Unit Planning	47
Dialog Size Improvement	47
Fix Multicomponent Stream Connection to MSS	47
Extended Workarea Policies	48
Fix ODBC Recipe Database Issues	48
Improve Counting for Discrete Amounts	48
Holding Equipment Included in Utilization Calculations	49
Utiliation Chart Can Display Hours	49
Activity Hours Chart	49
Fix for Inventory Based Scheduling Issue	51
Fix Units Change on Chart Copy/Paste	51
Activity Hours Report	51
WebViewer SQL Server Fix for Duplicate Staff Rows	52
Fix Update Revert Issue	52
Fix Unresolved Conflicts Issue	52
Work Areas Can be Reserved for A Project	52
Improve Copy/Paste in Batch, Procedure and Staff List	53
Campaign Average Cycle Time Calculation Improvement	53
Index	a

1 Version 11 Features

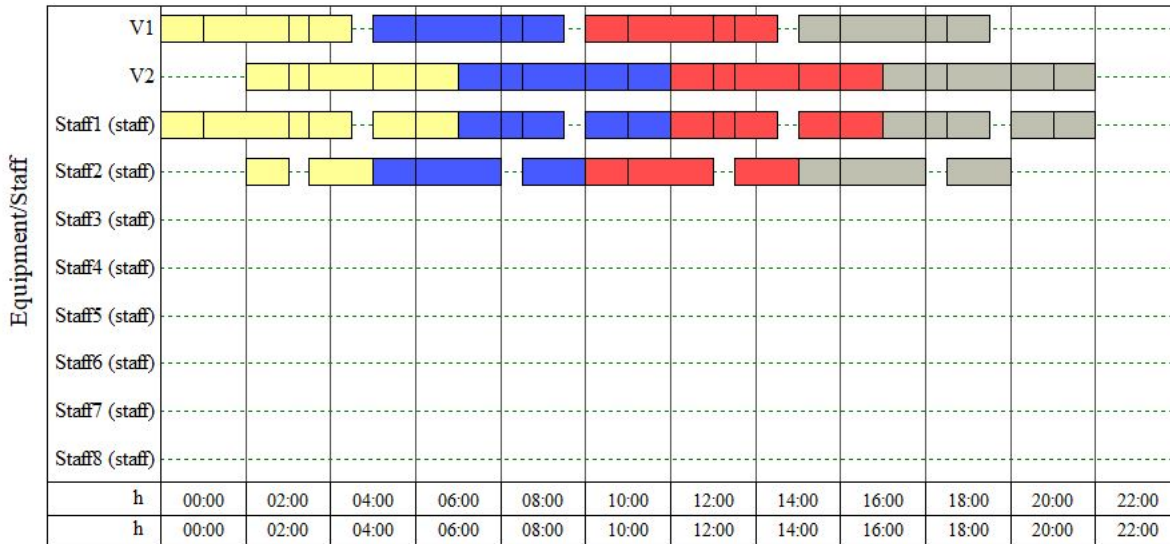
1.1 Staff Leveling

SchedulePro now includes a staff leveling feature that spreads the workload to unassigned or less assigned staff members. This feature should be applied after all the desired campaigns are scheduled. Leveling will not create new conflicts.

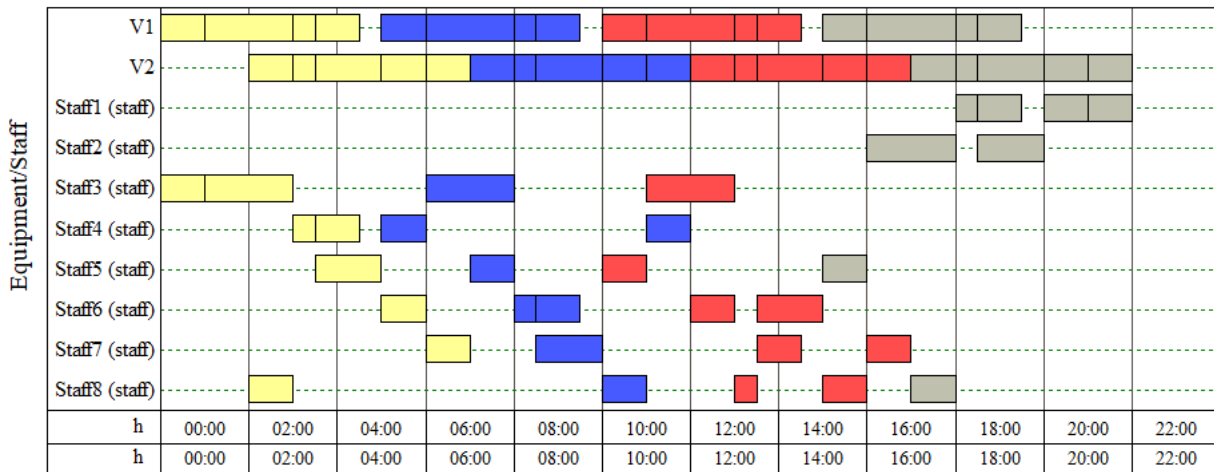
The feature is in the Scheduling main menu.



Below is standard priority-based staff assignment.



After leveling:



1.2 Scheduled Operation Editing Improvements

Editing of scheduled operations has been reorganized to provide clearer and more consistent behavior for editing scheduled operations.

Schedule Resources (Pooled) Resources (Variable) Status Comments

Link Type Starts at end of reference operation

Ref. Oper. Simple1-1-1: P-1 / Process (in Process Vessel)

Time Shift 2.000 h Fixed Shift, 0.000 h Flex Shift (Operation maximum flex shift -2.000 h)

Duration Link none

Actual / Modified Timing Forward Scheduled: shift affects start, duration affects end

Set Start 4/ 5/2023 12:00 Set Shift h

Set End 4/ 5/2023 13:00 Set Duration 60 min

Relative Start 360 min Total (Including breaks) 60

Relative End 420

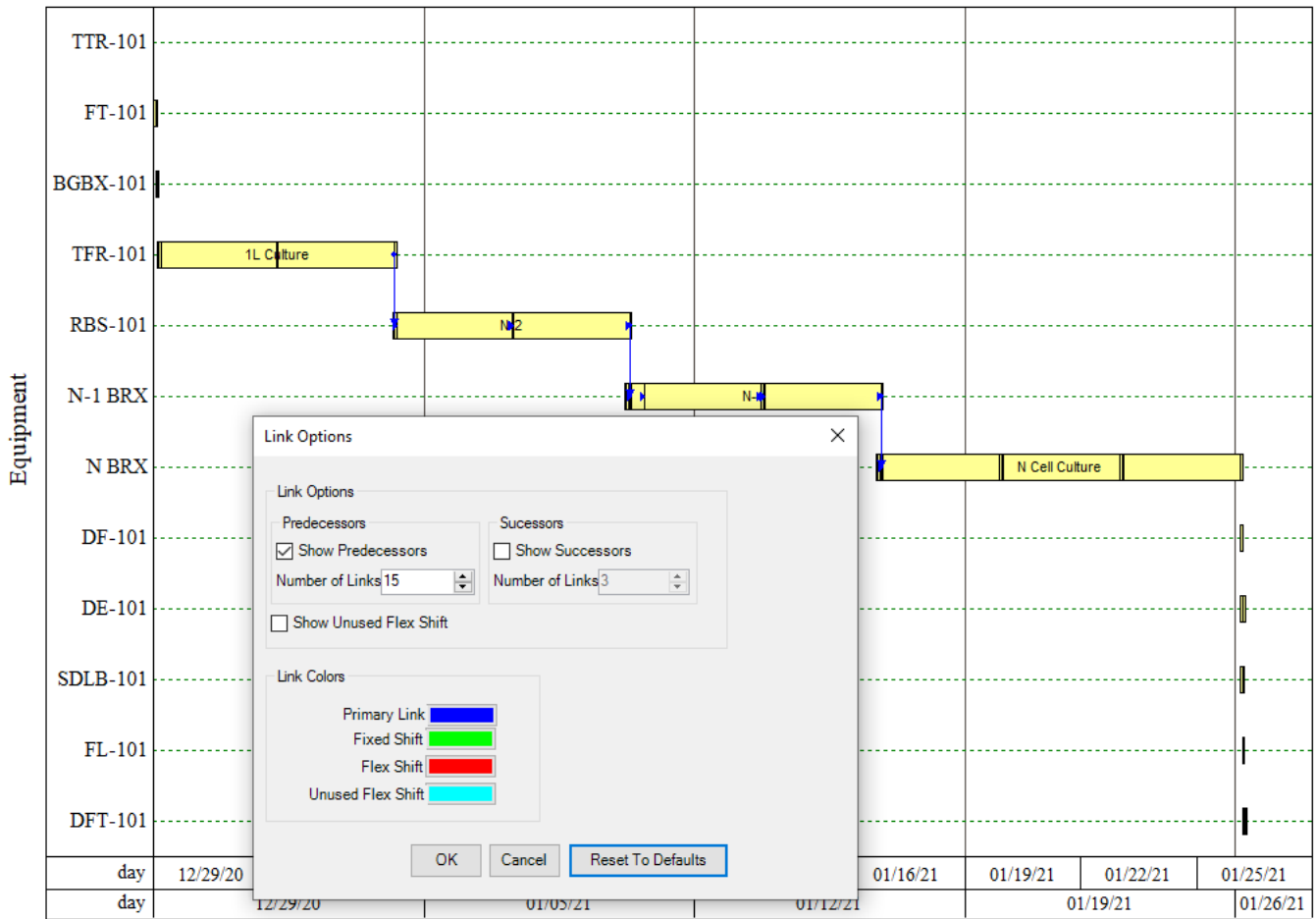
Clear All User Edits

Improvements include:

- Ability to delay backward scheduled operations without creating recipe inconsistencies
- Edited operations keep their assigned timing as other operations are moved as long as the batch remains consistent with the recipe.
- Operations can be marked as anchored. Anchored operations are treated as edited operations above.

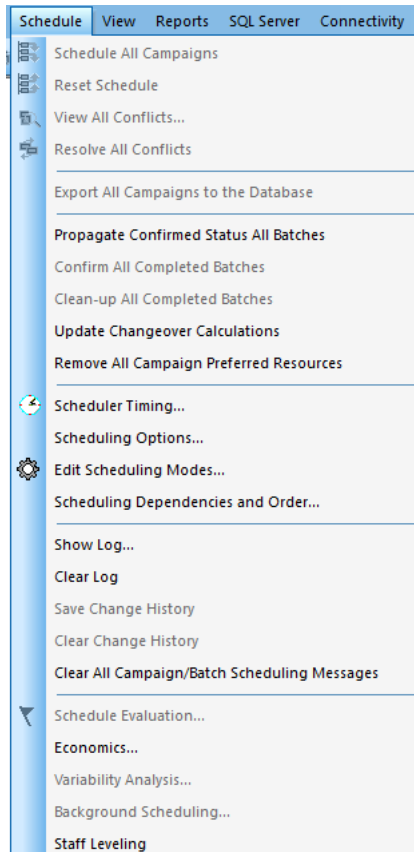
1.3 Scheduling Links Shown in Equipment Chart

The Equipment Occupancy Chart can display scheduling links.



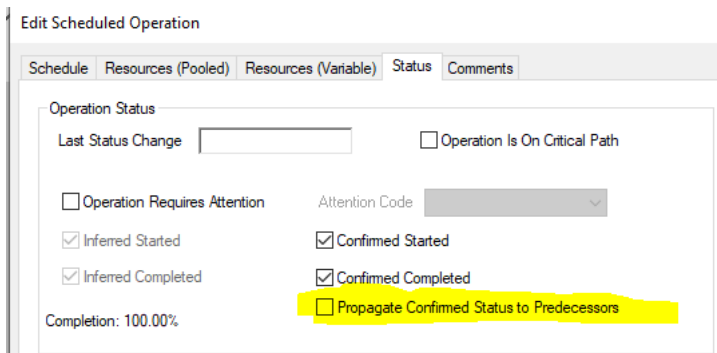
1.4 Schedule Menu Restructured

The Schedule main menu is reorganized.



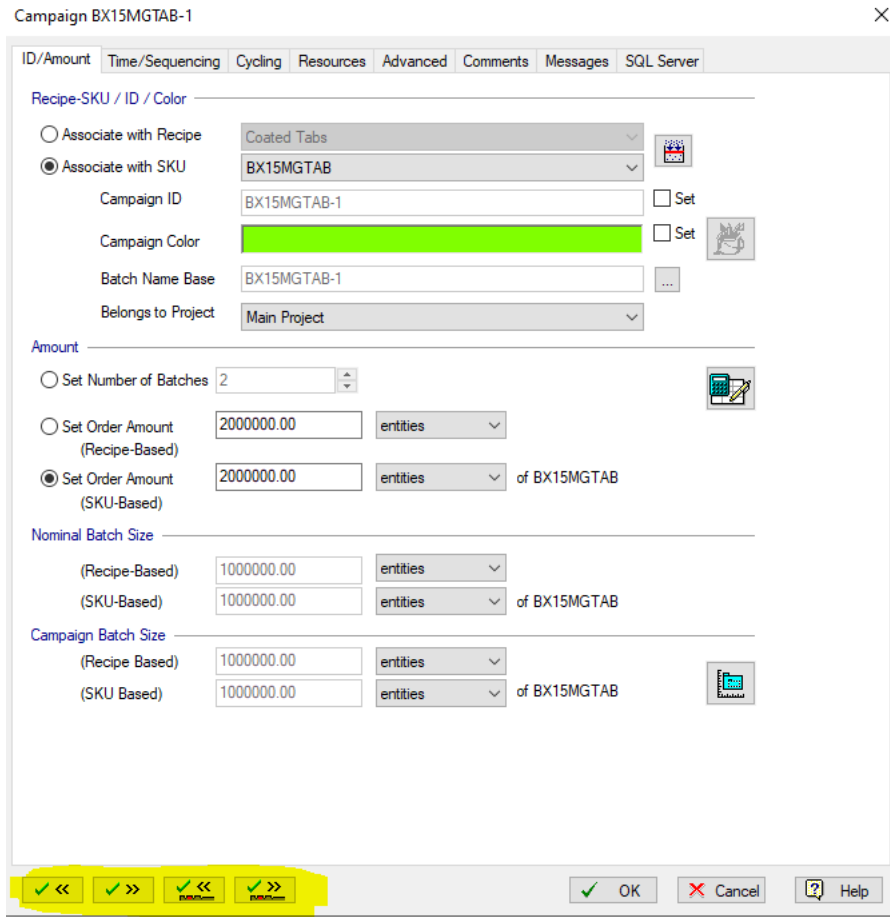
1.5 Status Propagation for Completed Operations More Extensive

When manually confirming completed operations in SchedulePro, the status will be propagated to all prior operations that have a scheduling link of any kind. This change means that backward scheduled earlier operations will be automatically considered confirmed.



1.6 Campaign Navigation Improved

The campaign properties dialog now has next campaign and previous campaign navigation.



1.7 Equipment Used-By More Readable

The equipment used-by feature now has a tree structure to make auxiliary usages easier to find.

CIP-1 Used by

Recipe Uses

Enable Changes -- No changes will be made to scheduled recipes

- Product-A
 - Upstream
 - Seed Fermentation
 - Set Up
 - Charge Media
 - Sterilize Media
 - Ferment
 - Transfer to Production Fermentor
 - CIP Seed Fermentor
 - Fermentation
 - Setup
 - Charge Media
 - Sterilize Media
 - Inoculation from Seed
 - Ferment
 - To Harvest
 - CIP
 - Centrifuge
 - Setup
 - Centrifuge
 - CIP
 - Downstream

1.8 Recipe Overview Dialogs are Sizeable

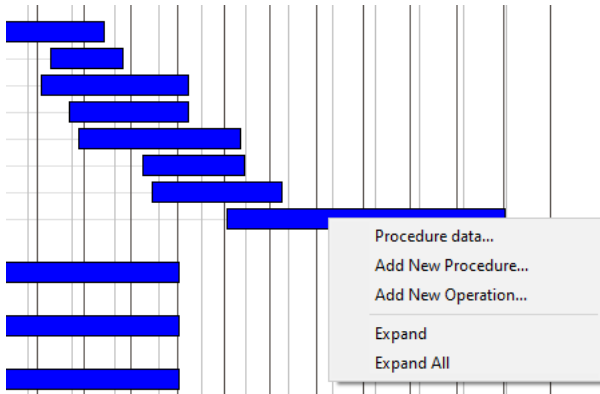
The user may resize the recipe overview dialogs.

Staff Assignments for Recipe Product-A

Procedure	Operation	Staff Required	CIP Staff 1 (in Upstream Facility)	CIP Staff 2 (in Upstream Facility)	CIP Staff 3 (in Upstream Facility)	Process Staff 1 (in Upstream Facility)	Process Staff 2 (in Upstream Facility)	Process Staff 3 (in Upstream Facility)	Process Staff 4 (in Upstream Facility)	DSP Staff 1 (in Downstream Facility)
Seed Fermentation	Set Up	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Charge Media	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Sterilize Media	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Ferment	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Transfer to Product	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	CIP Seed Fermentor	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fermentation (FR-1)	Setup	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Charge Media	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

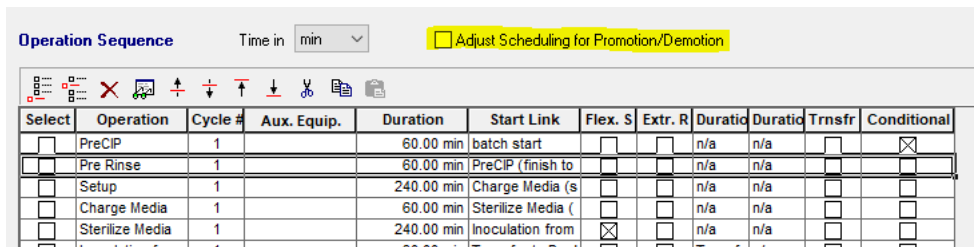
1.9 Recipe Editing in Gantt Chart

Operations or procedures may be added through the recipe Gantt chart.



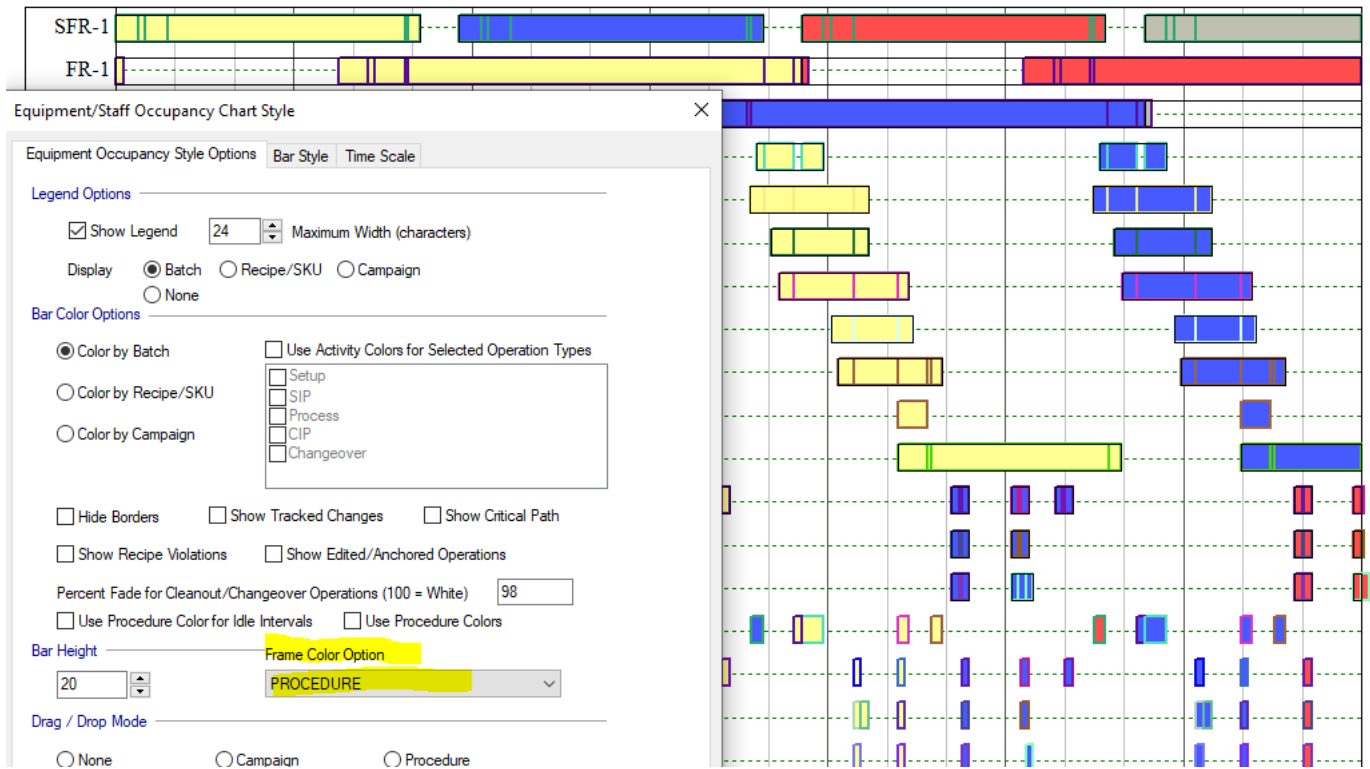
1.10 Operation Auto-Schedule now Optional

The user may control whether operations are automatically scheduled when they are promoted or demoted.



1.11 Equipment Chart Frame Coloring

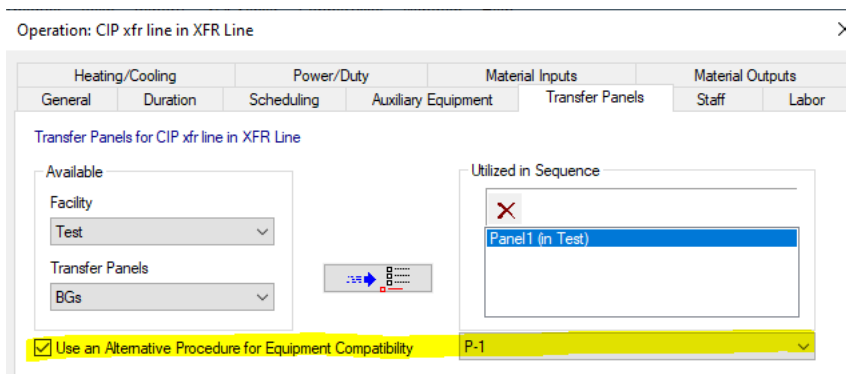
The user may select different border and interior coloring options in the Equipment Occupancy Chart.



1.12 Transfer Panel Alternate Equipment Compatibility

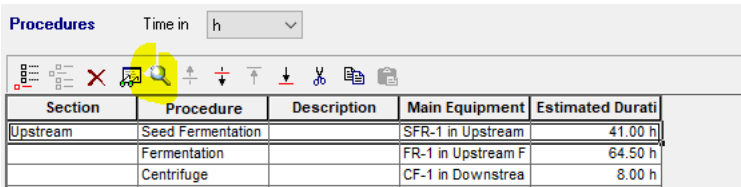
When transfer panel components have main equipment compatibility constraints it is sometimes useful for recipes with separate CIP of process equipment and transfer panels and lines.

This feature allows the transfer panel components in an operation to be chosen for compatibility with the equipment in a different procedure.



1.13 Recipe Navigation: Procedure Drill Down

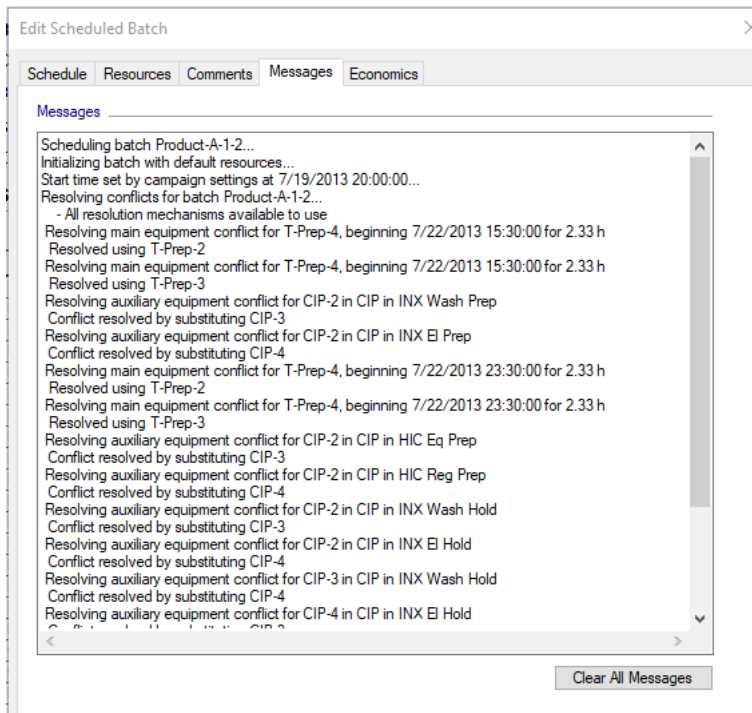
When viewing a recipe or section in a table view, the user may navigate to a procedure and view the operations by using the focus tool in the tool bar.



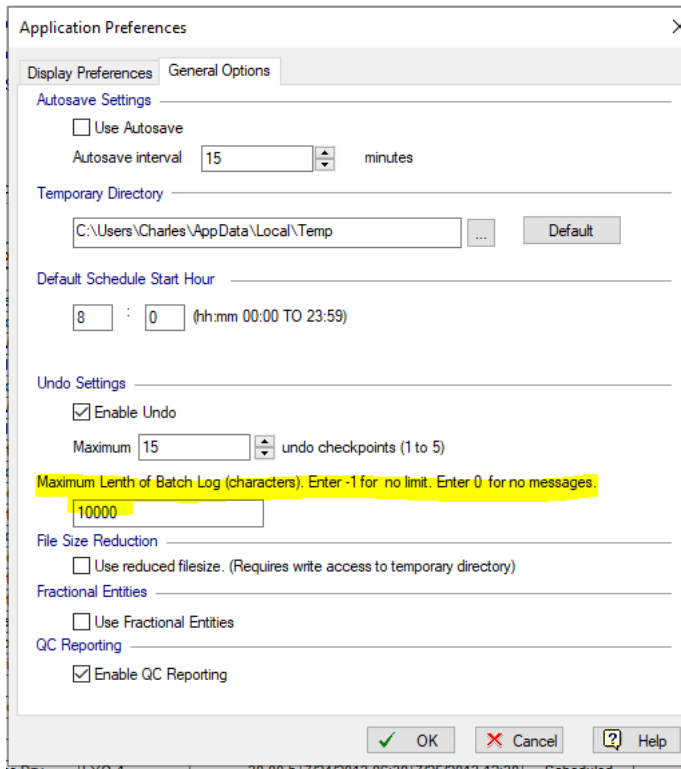
1.14 Batch Message Management

Batch messages can be very useful for understanding how conflicts have been resolved and which actions have been taken by the user. However the message field can grow indefinitely while the batch is scheduled and modified. The following tools have been added to help manage batch messages:

- A "Clear All Messages" button clears the messages for the batch

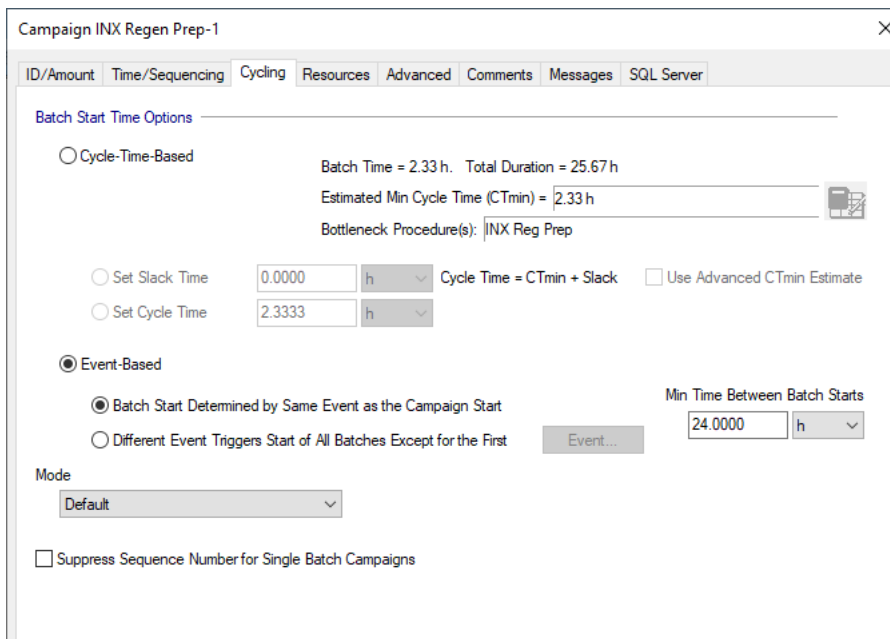


- A global setting in Edit/Preference places a per-batch character limit on the length of any batch message. If the limit is reached, older messages will be removed.



1.15 Minimum Cycle Time for Event Based Campaigns

For inventory campaigns there is now a minimum time between batches. This time applies when the next triggering inventory event is later than the specified value. This will not add batches beyond the last inventory event.



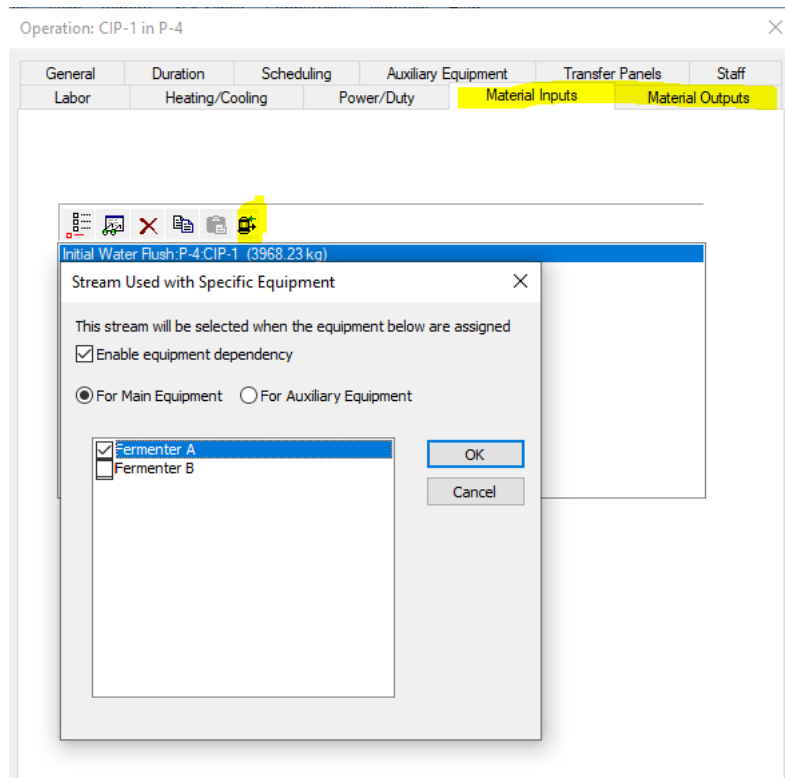
1.16 Transfer Panel Compatibility to Other Procedures

Transfer panel components compatibility is normally associated with the main equipment.

2 Version 10.3 Features

2.1 Equipment-Dependent Streams

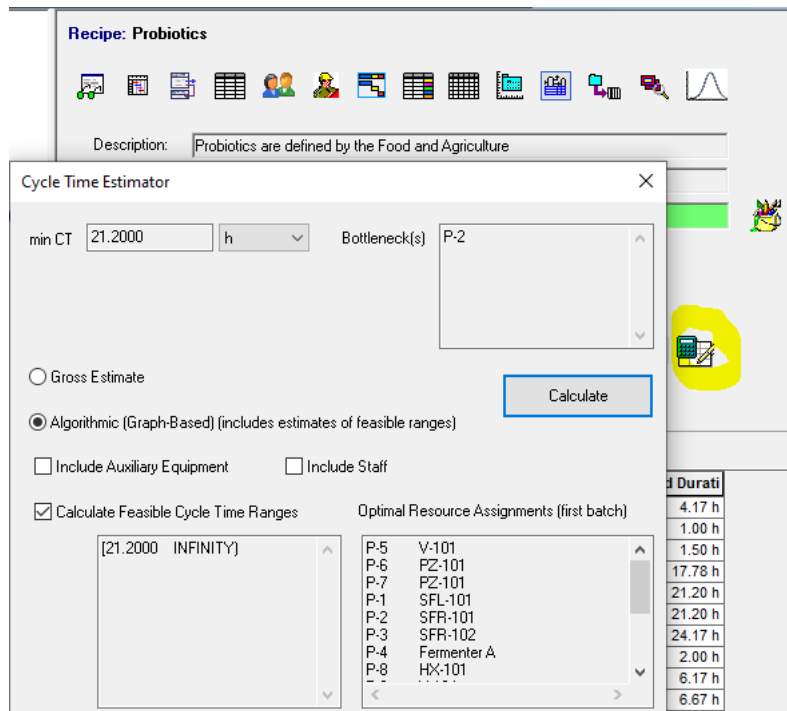
Material input and output streams can be selected according to main equipment.



Use the new equipment-dependency tool to select the equipment (main or auxiliary) for which a stream should be active.

2.2 Improved Cycle Time Estimate

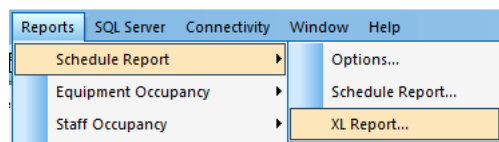
A new "Algorithmic" option is available for cycle time estimation. This option accounts for repeated equipment usage and can include staff and auxiliary equipment. These new options are available from the recipe view and in the campaign properties.



2

2.3 Excel Report

A preliminary schedule report generated directly in MS Excel is now available. This report displays all the scheduled operations along with timing.



2.4 All Reports Have Show on Exit Option

Reports may be generated and displayed immediately after exiting the report Options dialog with OK.

Show Report On Exit

2.5 Equipment Staff Utilization Report Improvements

Equipment/Staff utilization report: Summary section includes downtime. Periodic section includes by-shift option.

2.6 MS Access (MDB) Report Improvements

The MS Access (MDB) reporting has the following improvements:

- SchedulePro has an interface to delete reports from the MDB file.
- Additional operation detail has been added.
- Procedure duration added.
- A table linking batches for SKU producers and consumers.

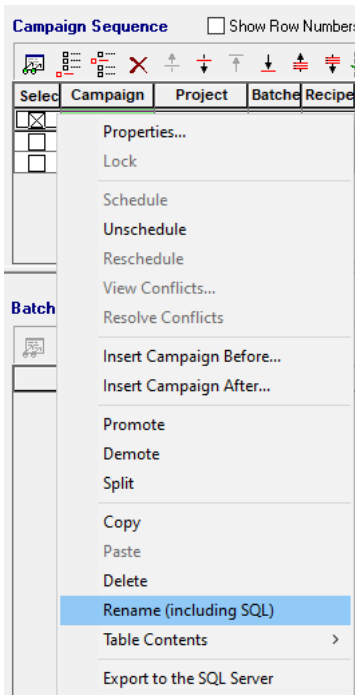
2.7 SQL Server Production Timing Update Improvements

The timing updates view has the following improvements:

- Improved sorting/filtering
- Faster timing update processing

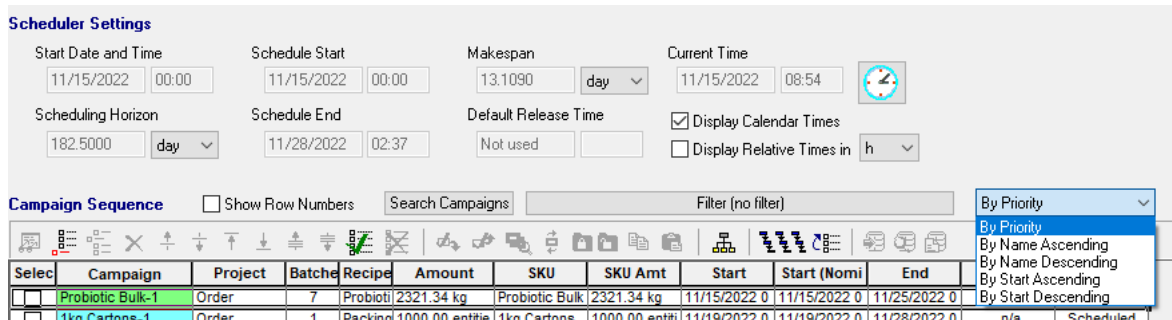
2.8 Campaign Renaming for Campaigns in SQL Server

A campaign in SchedulePro may be renamed so the name change is propagated to all its instances in the SQL Server database.



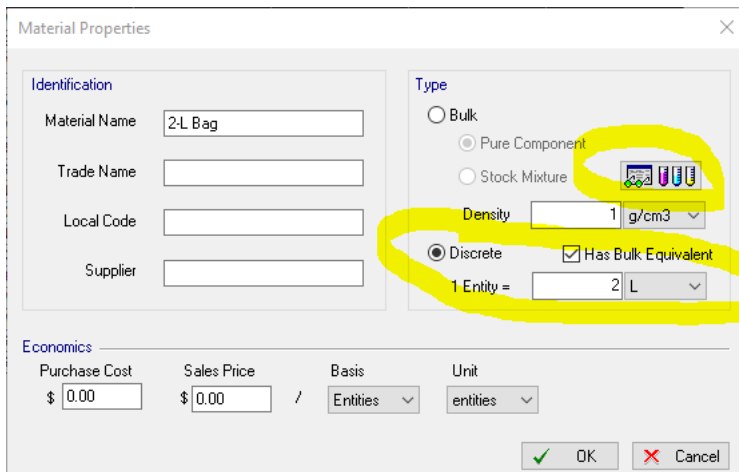
2.9 Sort Campaigns in Campaign List

Campaigns may be sorted without affecting their priority.



2.10 Discrete Streams May Have a Bulk Quantity

Discrete items may be associated with a specific quantity of bulk material. The contribution of discrete streams will be reflected in the bulk material totals.

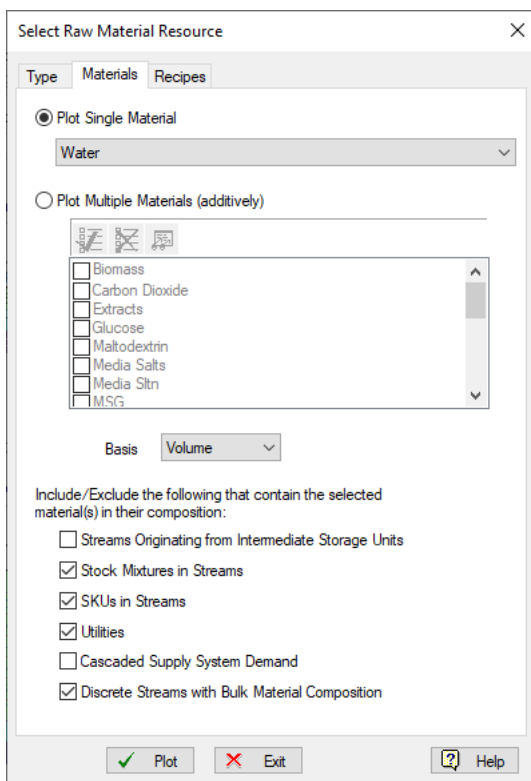


The 'Material Properties' dialog box is shown with the 'Type' section highlighted in yellow. The 'Discrete' radio button is selected, and the 'Has Bulk Equivalent' checkbox is checked. The 'Density' is set to 1 g/cm3 and '1 Entity' is set to 2 L. The 'Economics' section shows Purchase Cost and Sales Price both at \$0.00.

Field	Value
Material Name	2-L Bag
Trade Name	
Local Code	
Supplier	
Type	Discrete
Pure Component	<input type="radio"/>
Stock Mixture	<input type="radio"/>
Density	1 g/cm3
Has Bulk Equivalent	<input checked="" type="checkbox"/>
1 Entity =	2 L
Purchase Cost	\$ 0.00
Sales Price	\$ 0.00
Basis	Entities
Unit	entities

2.11 Resource Charts May be Shown in Volume

Resource charts may select mass or volume for bulk materials.

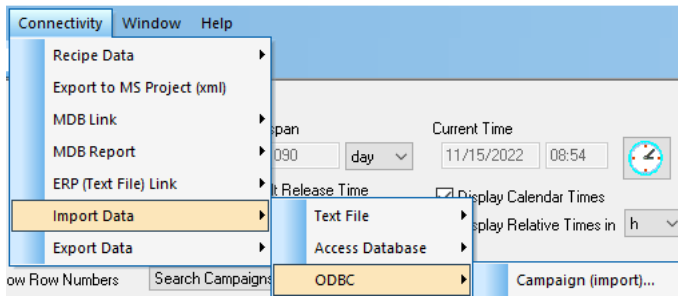


The 'Select Raw Material Resource' dialog box is shown with the 'Materials' tab selected. The 'Plot Single Material' radio button is selected, and 'Water' is chosen from the dropdown. The 'Basis' is set to 'Volume'. The 'Include/Exclude' section has several checkboxes, with 'Stock Mixtures in Streams', 'SKUs in Streams', 'Utilities', and 'Discrete Streams with Bulk Material Composition' checked.

Field	Value
Type	Materials
Plot Single Material	<input checked="" type="radio"/>
Material	Water
Plot Multiple Materials (additively)	<input type="radio"/>
Basis	Volume
Streams Originating from Intermediate Storage Units	<input type="checkbox"/>
Stock Mixtures in Streams	<input checked="" type="checkbox"/>
SKUs in Streams	<input checked="" type="checkbox"/>
Utilities	<input checked="" type="checkbox"/>
Cascaded Supply System Demand	<input type="checkbox"/>
Discrete Streams with Bulk Material Composition	<input checked="" type="checkbox"/>

2.12 ODBC Campaign Data Import/Export

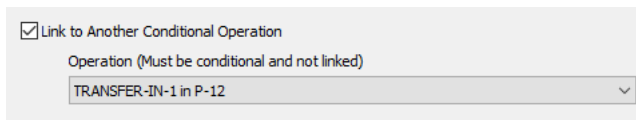
Campaign (production order) data may be exchanged with other systems available through ODBC.



The mapping interface allows selection of a table from the ODBC source and mapping of the fields to campaign values.

2.13 Linked Conditional Operations

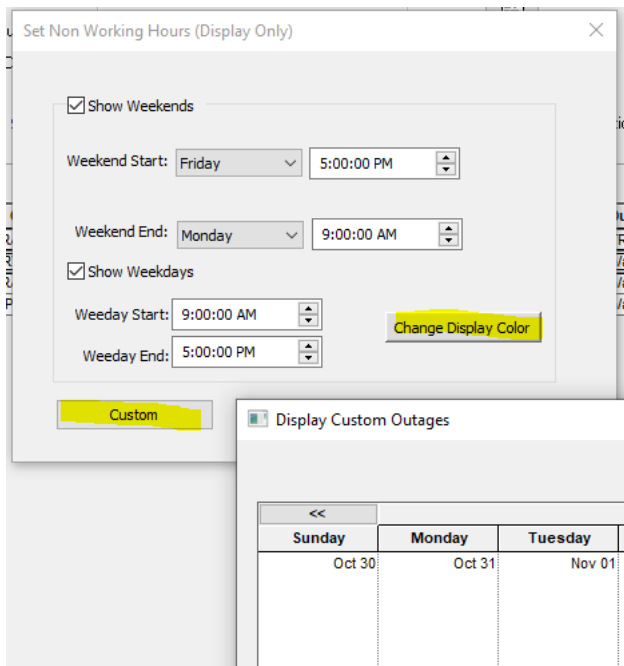
Operation execution may be conditioned upon the execution of some other conditional operation.



This allows a series of operations to act conditionally in unison.

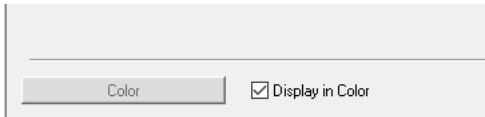
2.14 Improved Weekend Display

The non-outage weekend display is expanded to display evening hours and custom time off (holidays). The color for display in the Equipment Occupancy Chart is customizable.



2.15 Outage Color

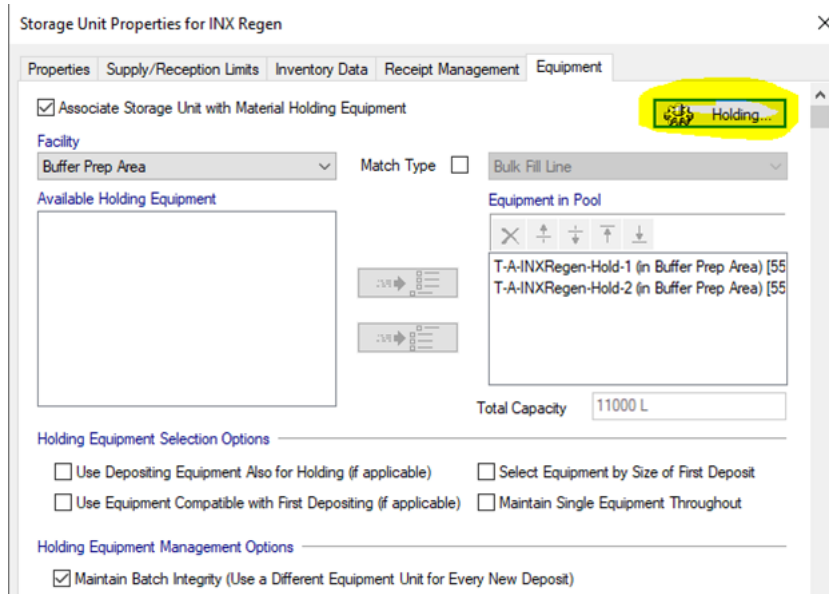
Facility and resource outages may be displayed with a user-selected color in the Equipment Occupancy Chart.



This does not affect the outage color in the outage calendar.

2.16 Material Holding Resources

When material is held in an equipment-associated Storage Unit, other resources may be associated with the holding activity.



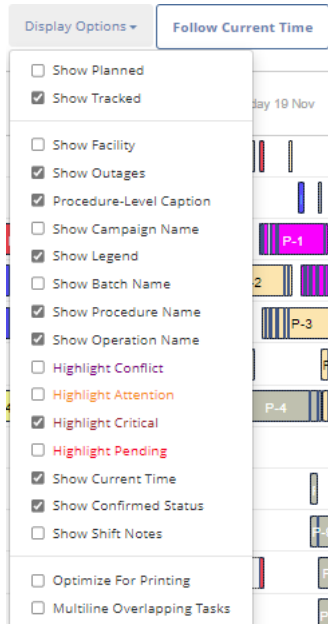
The event may have labor, staff, utilities or additional materials.

2.17 Web Tracker 10.3 New Features

A number of new features have been added for the SchedulePro Web Tracker. While there have many "behind the scenes" improvements, only the the changes that directly affect the user experience are listed in this section.

2.17.1 Gantt Chart Equipment Occupancy Page Display Options

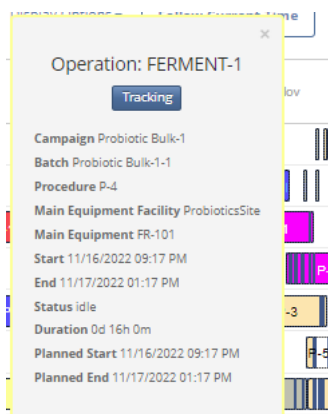
New display options are available for the Equipment Occupancy Chart:



- **Highlight Conflict:** Display a colored outline for conflicted procedures/operations.
- **Highlight Attention:** Display a colored outline for operations with an attention code.
- **Highlight Critical:** Display a colored outline for critical operations.
- **Highlight Pending:** Display a colored outline for operations that are in the past but which have not yet been declared started or completed.
- **Show Shift Notes:** Display comments that have been entered by the user.
- **Multi-line overlapping tasks:** Display multiple lines for equipment with multiple simultaneous usages.

2.17.2 Edit Tracking information in EOC.

Click any scheduled activity in the Equipment Occupancy Chart and click the "Tracking" button:



2.17.3 Make Equipment and Staff Updates

The Tracking Options now include options for changing staff and equipment.

Main Equipment: FR-101 in ProbioticsSite

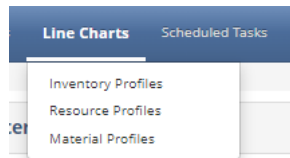
Auxiliary Equipment: CIP-102 x

Staff: Staff1 x

Start: 11/
End: 11/
Status: idle

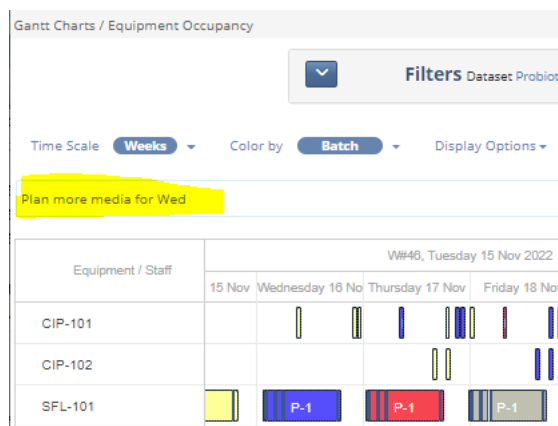
2.17.4 Line Charts Include Material and Resources

The Tracker can show charts for labor, utilities, and material resources.



2.17.5 Shift Notes

Users may add general notes (defined in the Configuration/Admin page). These notes may be displayed on the Equipment Occupancy, Scheduled Operations and Tracking pages.



3 Version 10.1 New Features

New Features in Version 10.1

This release supports the v10.1 WebTracker and consolidates all enhancements and bug fixes for V10.0.

3.1 Support for WebTracker 10.1

SchedulePro 10.1 Supports the new Web Tracker 10.1 (separate installation required) including:

- Resource and material usage charts
- Tracking includes the ability to modify equipment and staff assignments.

3.2 Multi-Select Operations in Procedure View

When editing recipes, the operations list allows multiple selections. The cut/copy/paste and delete now apply to the checked operations.

Unit Procedure **Seed Fermentation**

in Recipe:

Description:

Equipment:

Work Area:

Procedure Size:

No. of Cycles:

Operation Sequence Time in: Adjust Scheduling for Promotion/Demotion

Select	Operation	Cycle #	Aux. Equip.	Duration	Start Link	Flex. S	Extr. R	Duratio	Duratic	Trnsfr	Conditional
<input checked="" type="checkbox"/>	Set Up	1		180.00 min	batch start	<input type="checkbox"/>	<input type="checkbox"/>	n/a	n/a	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	Charge Media	1		60.00 min	Set Up (finish to	<input type="checkbox"/>	<input type="checkbox"/>	n/a	n/a	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	Sterilize Media	1		180.00 min	Charge Media (fi	<input type="checkbox"/>	<input type="checkbox"/>	n/a	n/a	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Ferment	1		1920.00 min	Sterilize Media (f	<input type="checkbox"/>	<input type="checkbox"/>	n/a	n/a	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Transfer to Prod	1		30.00 min	Ferment (finish t	<input type="checkbox"/>	<input type="checkbox"/>	n/a	n/a	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	CIP Seed Ferme	1	CIP-1	90.00 min	Transfer to Prod	<input checked="" type="checkbox"/>	<input type="checkbox"/>	n/a	n/a	<input type="checkbox"/>	<input type="checkbox"/>

3.3 Improved Equipment Deletion

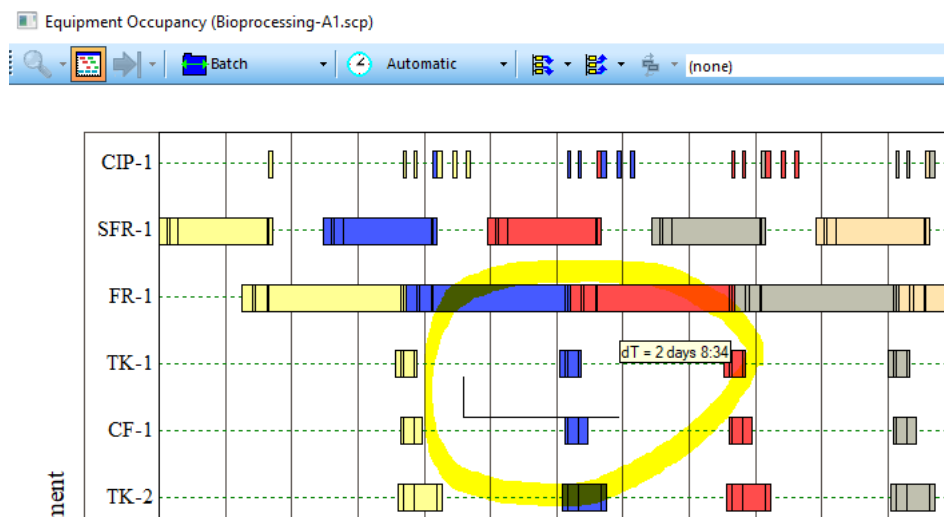
On deleting equipment, SchedulePro provides more detail on current usages that may prevent deletion. SchedulePro offers an aggressive deletion option which will unschedule any campaigns that use the equipment and remove all references to it.

3.4 Improved Handling of Repeated Operation/Procedure Names

It may be possible to import recipes that contain multiple procedures with the same name or multiple operations with the same name within a procedure. The SQL Features do not support this, so this condition is listed in the recipe warnings. There is also an option to have SchedulePro automatically correct the problem.

3.5 Improved Elapsed Time Measurement in EOC

The Equipment Occupancy Chart now displays a temporary line when using the elapsed time measurement tool. Left-click and hold the mouse to measure the time between two points on the chart. The time is displayed as Days Hours:Minutes.



3.6 V10.1 Bug fixes

V10.1 Updates

Revision Number	Date	Description
4351	10 February 2022	Fix midnight activity reporting in Daily Activity Report.
4351	10 February 2022	Add Folder to recipe-to-text export.
4338	4 January 2022	Fix save-as-old version issue for resources with outages.

4334	27 December 2021	Fix issue with extra-scheduling updates.
4333	27 December 2021	Fix staff-assignment/staff deletion crash.
4331	21 December 2021	Fix Campaign Import/Export
4317	7 December 2021	Fix staff deletion/ordered staff crash
4316	7 December 2021	Scheduling improvements

V10 Bugs Fixed in V10.1

- Edit preference "Used Reduced File Size" setting not set.
- Stream dialog density correctly updates in response to composition change.
- Operation copy/paste includes staff
- Critical path calculation improvements
- Easy-Print charts fixed
- User-activated conditional operations not activating and updating correctly.
- Fixed some scheduling/conflict resolution issues.
- Fixed crash on material report generation.
- Correct staggered use mode for equipment sharing.

4 Version 10 New Features

New in Version 10

4.1 New Examples and Databases Location

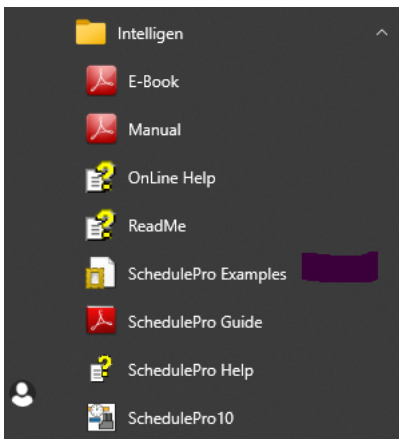
SchedulePro now saves the databases and examples in the following location:

C:\Users\Public\Intelligen\SchedulePro\version

4.2 New Examples Directory

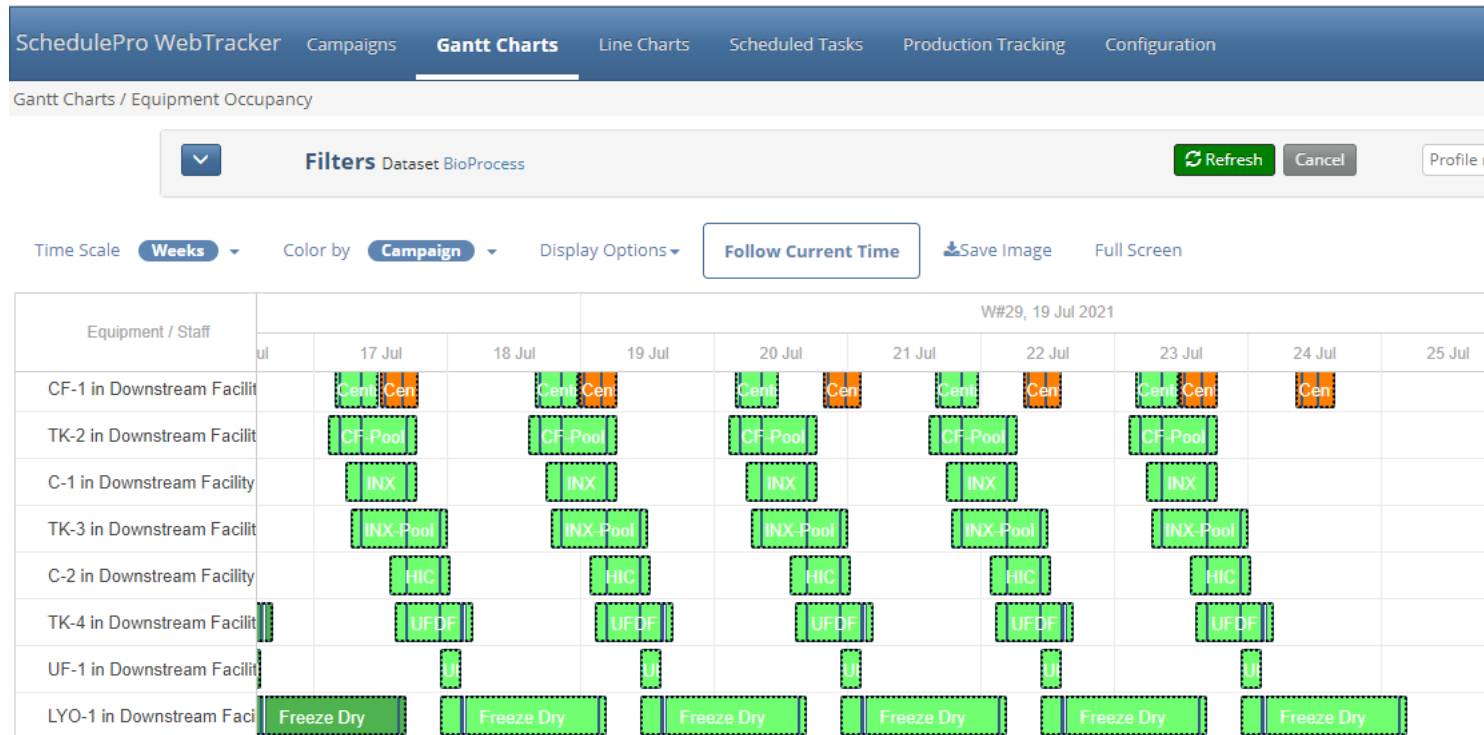
There is an examples directory in the Windows Start menu.

This provides a quick link to the example documents.



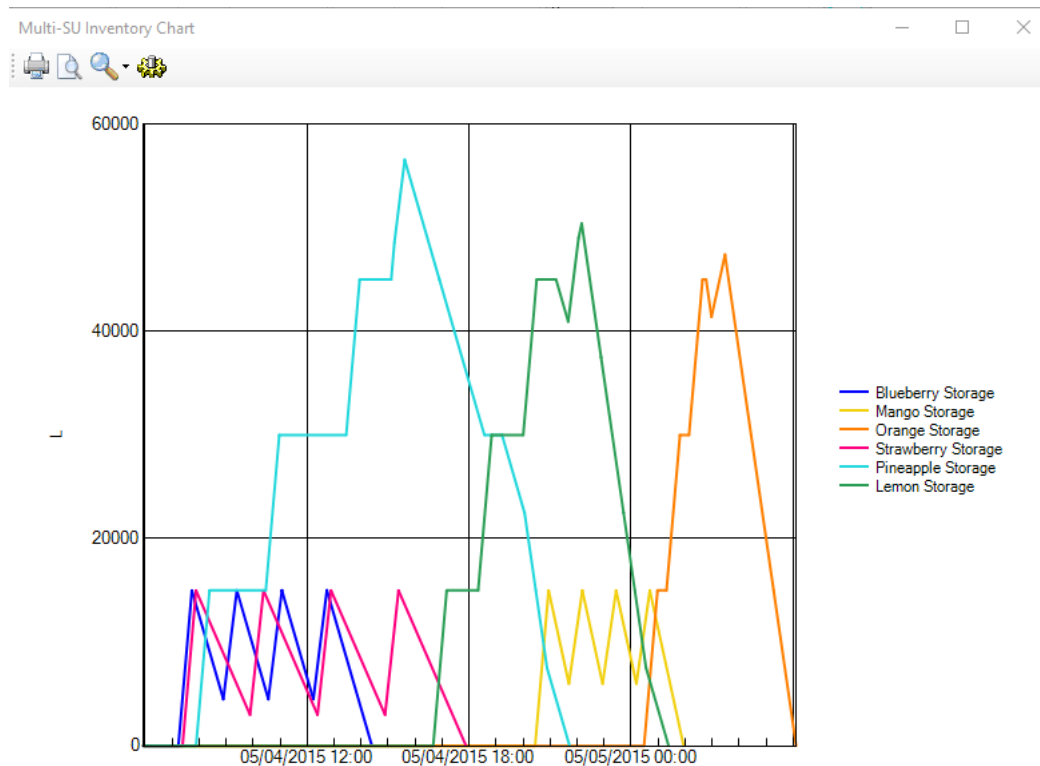
4.3 Web Tracker Support

Version 10 supports a completely new version of the Web Tracker with with many new features.



4.4 Multiple Inventory Plotting

SchedulePro can plot multiple inventory profiles on a single chart.



4.5 Improved Continuous Processing Options

SchedulePro 10 introduces features to allow for improved scheduling of semi-continuous activities.

Operation: Fill in Filling

Labor	Heating/Cooling	Power/Duty	Material Inputs	Material Outputs	
General	Duration	Scheduling	Auxiliary Equipment	Transfer Panels	Staff
Operation	Fill				
Procedure	Filling				
Section	Main Section				
Branch	Main Branch				
Recipe	UHT Milk				
Operation-Type (Optional)					
Process ▼ Conditional Scheduling <input type="checkbox"/>					
<input checked="" type="checkbox"/> Is on Continuous Flow Path					

See the Milk Processing example for details.

4.6 Improved Tracking Options

SchedulePro 10 introduces new features for tracking changes to the schedule.

4.6.1 Attention Code Tracking

Edit Scheduled Operation

Schedule	Resources (Pooled)	Resources (Variable)	Status	Comments
Operation Status				
Last Status Change <input type="text"/>		<input type="checkbox"/> Operation Is On Critical Path		
<input checked="" type="checkbox"/> Operation Requires Attention	Attention Code ▼			
<input type="checkbox"/> Inferred Started	<input type="checkbox"/> Confirmed Sta	FacilityClosed		
<input type="checkbox"/> Inferred Completed	<input type="checkbox"/> Confirmed Cor	EquipDown		
Completion: 0.00%		<input type="checkbox"/> Propagate Confirmed Status to Predecessors		
		StaffOff		

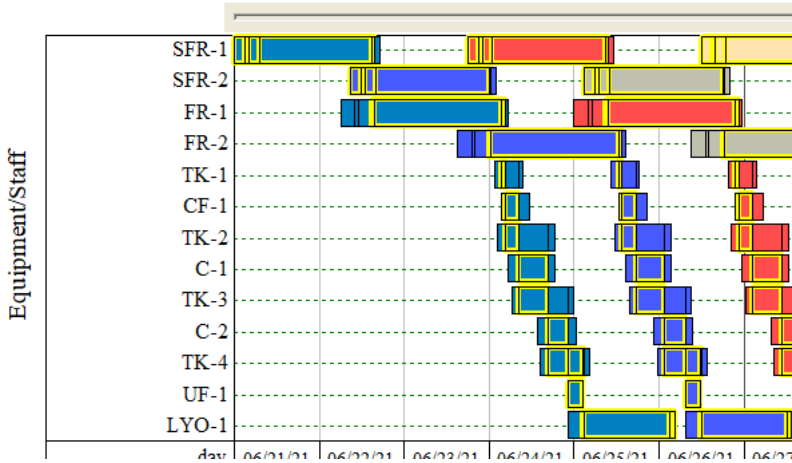
When updating the completion status from SchedulePro or from the Web Tracker it is possible to enter user-defined attention codes that can be used to track the frequency of common process issues.

4.6.2 Limited Update Mode

When a scheduled task is modified SchedulePro normally propagates the change to the rest of the batch. The user now has control over whether updates are propagated. Go to **Options/Timing Update Options**.

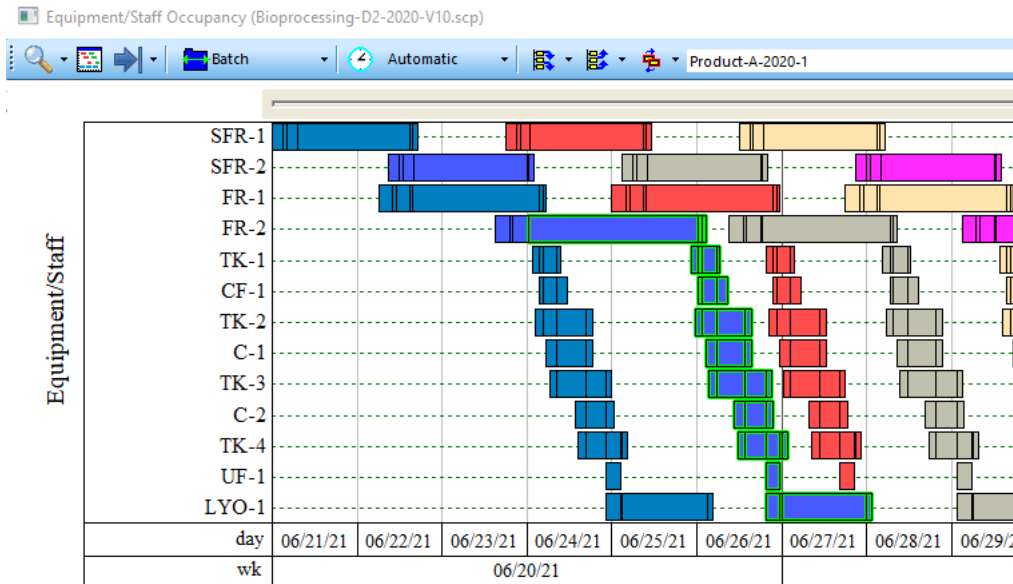
4.6.3 Critical Path Display

SchedulePro can now show critical path operations. In SchedulePro these are operations which, if delayed, would affect the end of the campaign. It is also possible to designate operations as critical.



4.6.4 Changed Operations

SchedulePro can now highlight all the changes that result from edits to the schedule.



Here the operations that are bordered in green have been changed as a result of increasing the duration of an operation in FR-2.

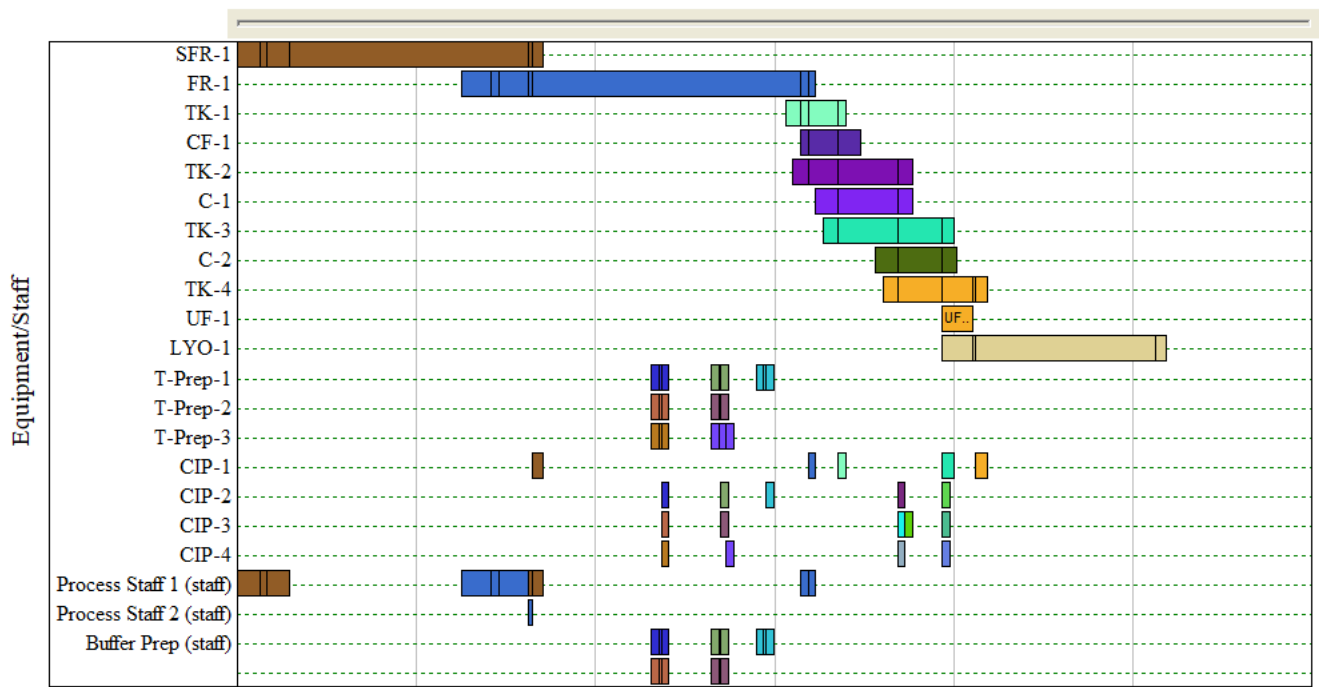
The specific changes are shown in the operation properties.

Edit Scheduled Operation

	Schedule	Resources (Pooled)	Resources (Variable)	Status	Comments	Changes From Baseline
			Previous State		Current State	
Start			6/26/2021 07:30:00		6/26/2021 19:30:00	
End			6/26/2021 11:30:00		6/26/2021 23:30:00	
Main Equipment			TK-4		TK-4	
Aux Equipment			UF-1 WFI-Supply		UF-1 WFI-Supply	

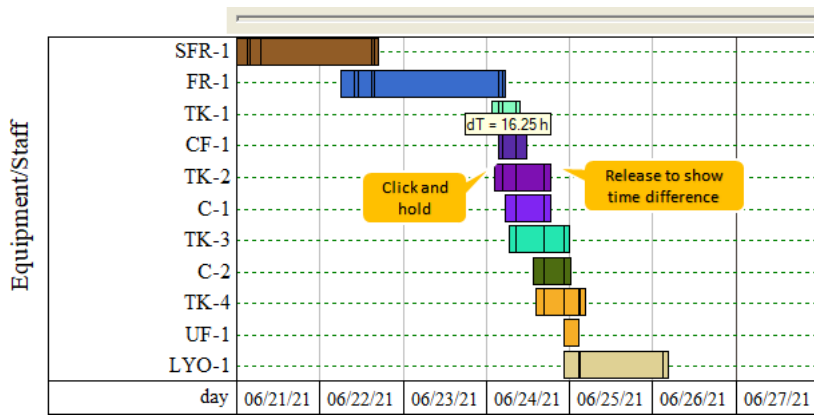
4.7 Equipment Chart Color-by-Procedure

The equipment occupancy chart (EOC) can now show procedure colors. This option is available in the EOC style options.



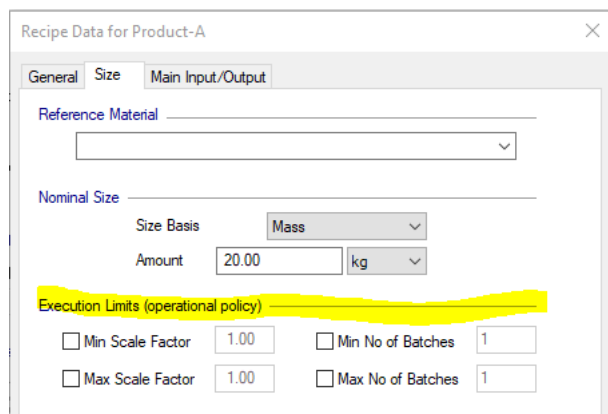
4.8 Equipment Chart Time Measure

Use the mouse to "measure" time intervals in the Equipment Occupancy Chart.



4.9 Campaign Scaling Limits In Recipe

SchedulePro now allows the user to set limits on the allowable batch sizes.



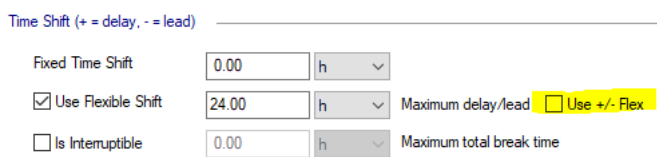
4.10 +/- Flex Shifts

Bi-directional flex shifts are now allowable.

Use this option to allow SchedulePro the possibility of moving an operation either earlier or later to avoid conflicts.

SchedulePro will try the early option first.

Note: SchedulePro always allows overlapping operations within a procedure unless they share auxiliary equipment.



4.11 Share Staff with Other Operations

If there is a series of operations which should be performed by the same staff. Use the **Share Staff with Other Operations** option to create a list of operations which should use the same staff.

Note that this is a soft constraint. SchedulePro will attempt to assign the staff if it can, but other staff may be used if necessary.

Operation: CIP Seed Fermentor in Seed Fermentation

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

Staff Assignment for CIP Seed Fermentor in Seed Fermentation

Available

Buffer Prep Area

Buffer Prep

Included

- CIP Staff 1 (in Upstream Facility)
- CIP Staff 2 (in Upstream Facility)
- CIP Staff 3 (in Upstream Facility)
- CIP Staff 4 (in Upstream Facility)
- Process Staff 1 (in Upstream Facility)
- Process Staff 2 (in Upstream Facility)
- Process Staff 3 (in Upstream Facility)
- Process Staff 4 (in Upstream Facility)

Use persons Use All

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

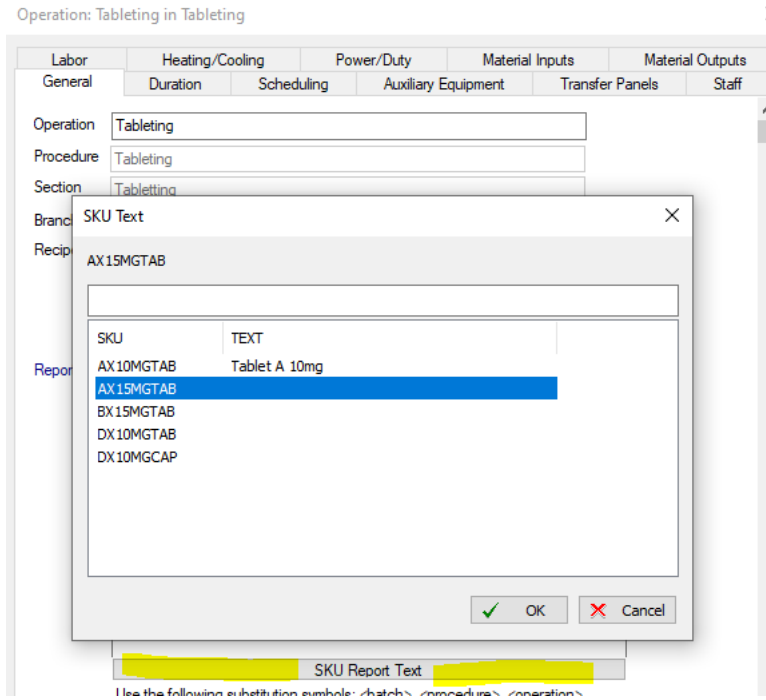
Filter Available Staff for Skills
 Max Working Time h

Staff by Skills
 Over a span of day

Keep Staff with Equipment During Shift
 Before the start of this operation

4.12 SKU Based Report Text

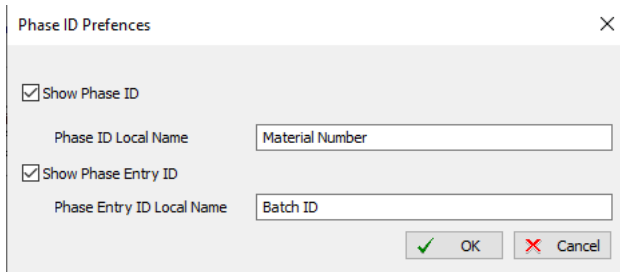
In recipes that are associated with SKUs, an operation's report text may be SKU-dependent.



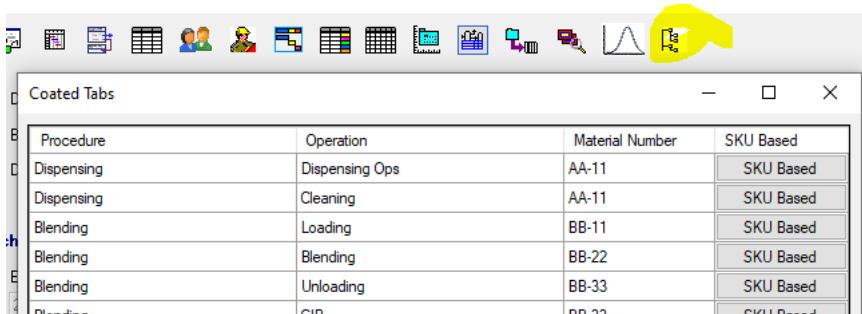
4.13 Phase ID / Phase Entry ID

To assist with reporting, operations may be labeled with a phase Id. This is a step identifier intended to help map SchedulePro to other plant systems. Furthermore in each scheduled batch, every phase Id might have a unique Phase Entry Id.

These terms may be given aliases in **Edit/Phase Id Preferences**.



The IDs are assigned from the recipe view. If the recipe is SKU-based, the phase IDs may be SKU-dependent.



Phase Entry IDs are read in from a text file with a sequence of Phase Entry IDs for each phase ID. This is in the **Edit/Import Phase Entry Ids** menu option.

4.14 QC Reporting

For sites that use a laboratory management system such as Smart QC, SchedulePro can generate a list of samples for upload.

In the recipe the the sampling operations should have their own operation type and should have sample ID information in their report text or description. Use **Report/QC options** to configure the details.

Report Options ×

Economic Report Options		Reorder Report Options			Inventory Report Options		
Schedule	Equipment Occupancy	Equipment Utilization	Staff	Materials	Daily Activity	Gantt	Recipe
Send to Personal Calendars		Labor Report Options		Outage Report		QC Reporting	

Report for Operation Type QC Sample ▼

Include Material Number Information
 Include Operation Description
 Include Operation Report Text
 Include SchedulePro Information
 Allow Repeated Entries in Different Files Clear History
 Generate File on SQL Export

QC Sample Prefix

File Name
 + datetime.txt

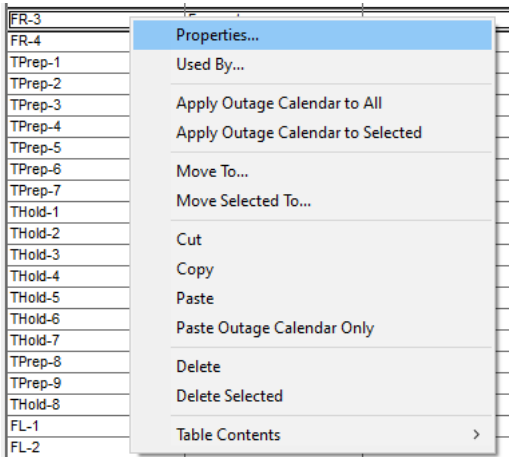
File Directory Find...

4.15 Ad Hoc Scheduling

SchedulePro has a new file based scheduling that creates a recipe together with a campaign. The intent is to allow easy scheduling of on-demand maintenance activities.

4.16 Resource Editing Options

Several new editing features for equipment and staff.



- Apply outage calendar to all - define outages just once.
- Apply outage calendar to selected - provides for creating a list of resources to which the outages of the selected resource will be copied
- Move Selected to... - Move a group of resources to another facility.
- Paste Outage Calendar Only - If a resource was copied, only the outages are pasted to the destination.
- Delete Selected -- Delete a group of resources.

4.17 New Examples

Milk Processing - Highlights continuous processing features.

Ad Hoc Scheduling - In the File Upload folder, shows how to use the schedule-from-file feature.

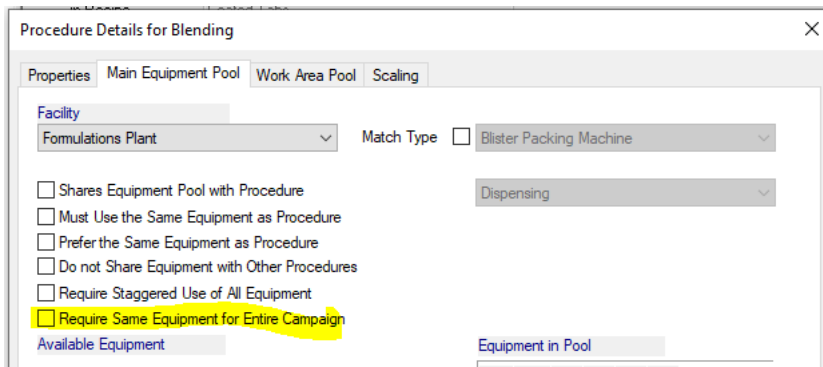
Conditional Operations - (Misc. folder) Example extended to include batch count and user-activated scheduling.

5 Version 9.1 Enhancements

Enable keep equipment for project. Use the Edit/Preferences feature to check the box:

"Keep Eq with Campaign = Keep with Project"

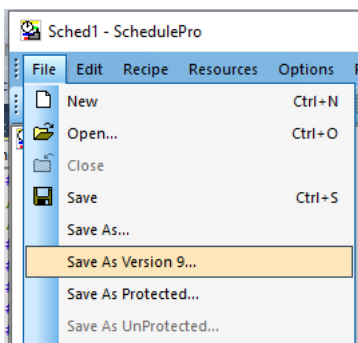
If a main equipment is reserved for the entire campaign in the procedure as shown below, the same equipment will be used for every campaign in the project.



5.1 Save as Version 9.0

Save As Version 9.0

Files opened or created in version 9.1 may be saved in a version 9.0 compatible format. Files saved in version 9 format may lose some version 9.1 features.

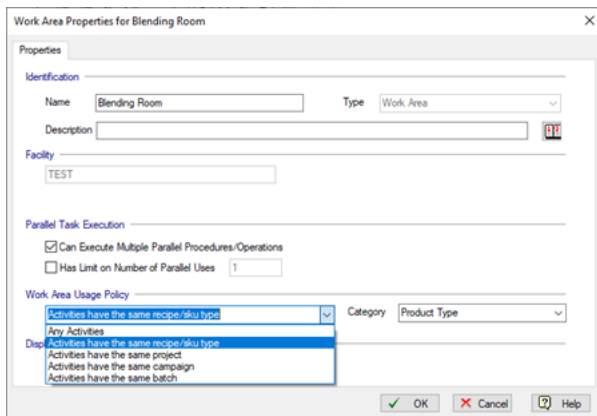


5.2 Added Work Area Usage Policies

Work areas have two added usage policies:

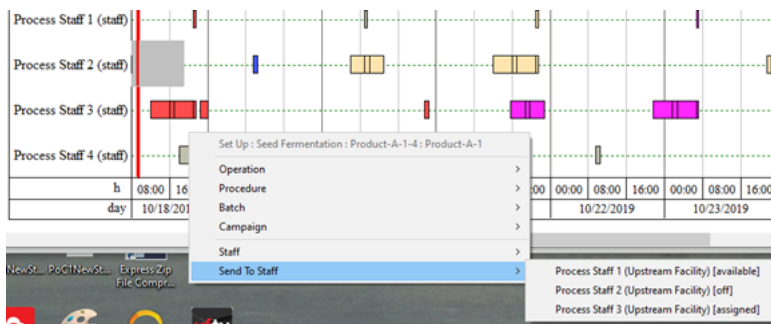
Same Recipe/SKU Type: Procedures may share a work area if they are in campaigns with the same recipe or SKU type in the selected type category. The types are the same that are used for the changeover matrix feature.

Same Project: Procedures may share a work area if they are in campaigns that are part of the same project.



5.3 Staff Status Designations

When assigning staff to scheduled operations, SchedulePro now indicates whether the possible staff alternatives are Available (may be assigned with no conflict), Assigned (already assigned to another operation), or Off (out due to a staff or resource outage).



5.4 Version 9.0 Enhancements

5.5 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.

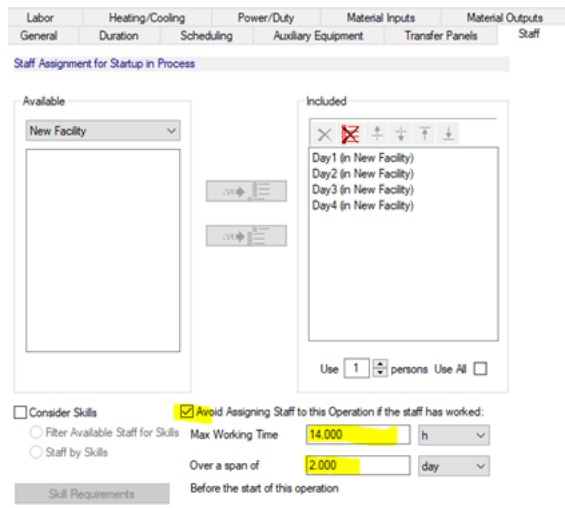
Recipe Streams Import/Export

Recipe material streams may be imported or exported.

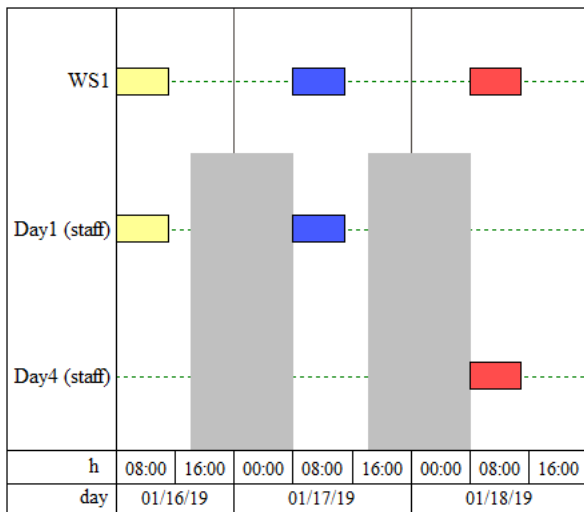
5.6 Staff Working Hours Limits

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.



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:

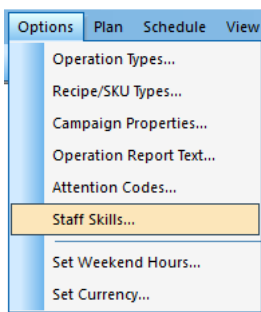
HAS MAX STAFF DUR – (TRUE/FALSE) – Turn the feature on/off.

MAX-STAFF_SPAN _HOURS – The elapsed time over which to measure the staff usage.

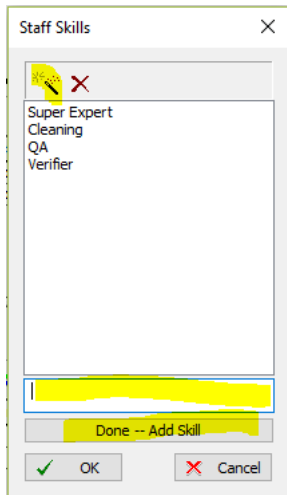
MAX STAFF HOURS – The maximum working duration for the staff.

5.7 Scheduling Staff by Skills

Staff skills are defined at the global level.

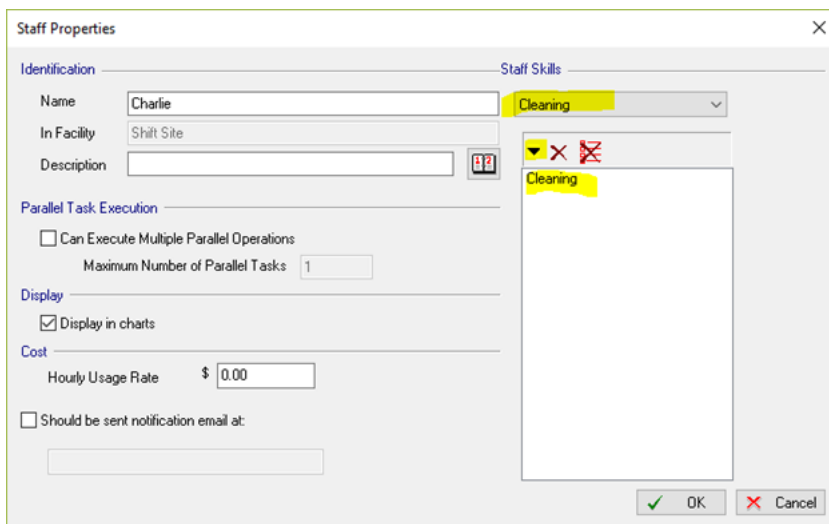


Select Options >> Staff Skills...



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

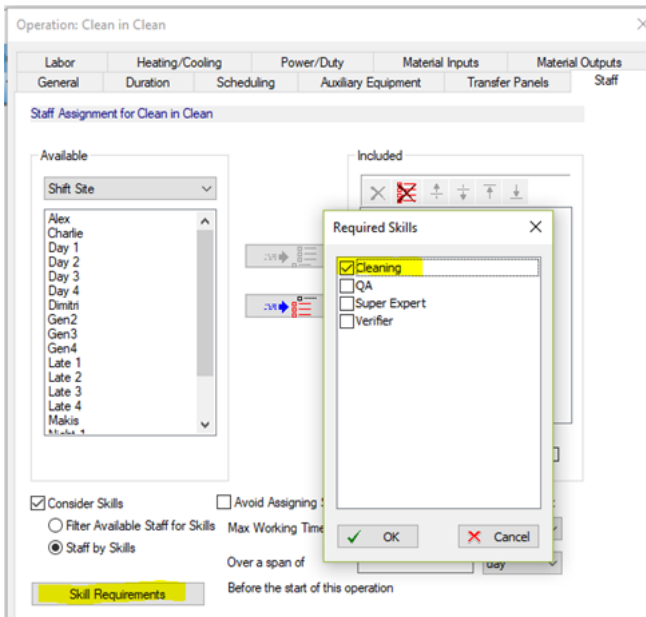
Skills may be assigned to staff.



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.

5.8 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.

5.9 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.

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

In the Web Viewer, select Key Dates Report.

Batch Name	Day 0 Start	Work Seed	Harvest Start	Pack/Disp End
MP001	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
MP004	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
MP007	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
MP010	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
MP013	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
MP016	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
MP019	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
MP022	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
MP025	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
MP028	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

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.

5.10 Staff Email Notifications

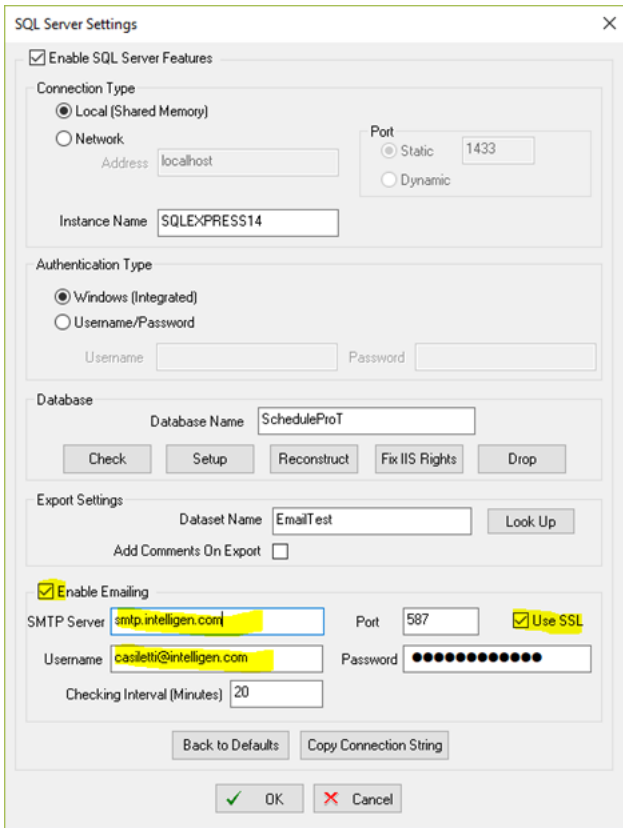
The email notification feature allows staff to be notified when they are within a specified time of an upcoming assignment. This feature works with the database to ensure that notifications are not sent out more than once unless there has been an update in the assigned campaign.

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

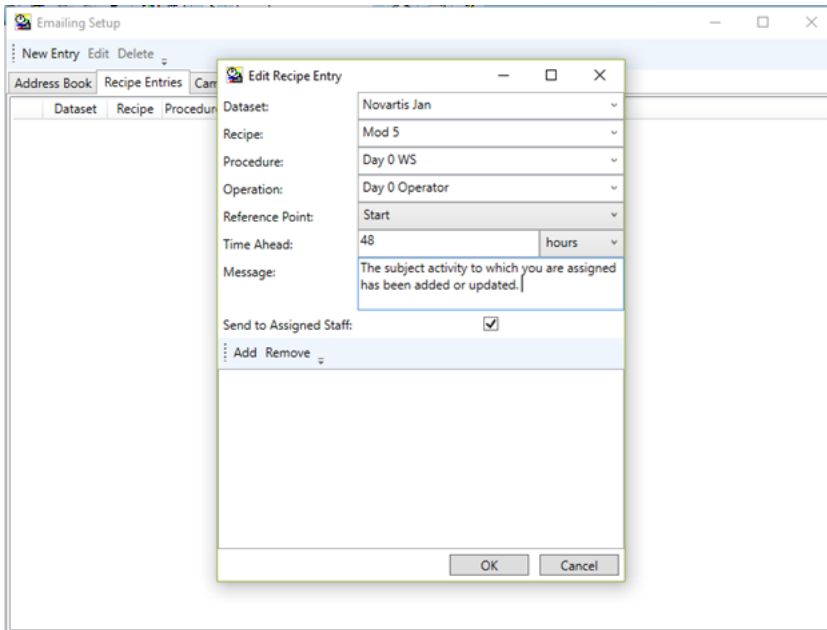


Configuring the Email Settings

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.

5.11 Campaign Level Scheduling Mode

The Scheduling mode may be set separately for each campaign.

5.12 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

5.13 Zero Duration Operations

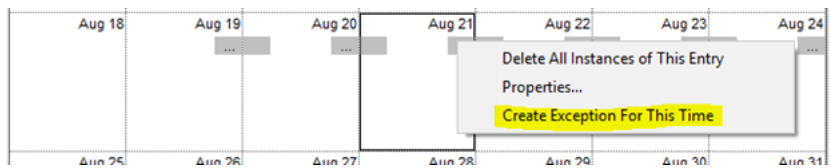
SchedulePro now allows zero-duration operations (with a warning).

5.14 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.

5.15 Exceptions for Repeating Outages

SchedulePro allows for breaks in a repeating outage.



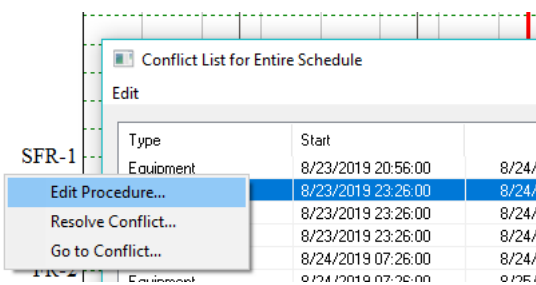
5.16 Apply Outage Calendar to Selected Resources

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.

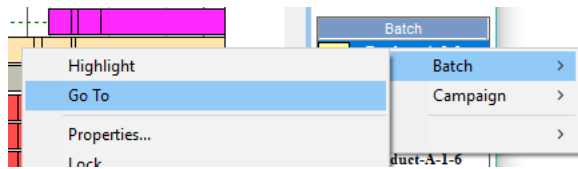
5.17 EOC Search/Go-To Improvements

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

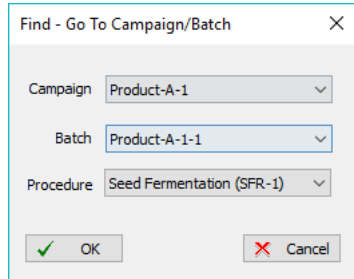
There is a Go-To feature in the View-Conflicts list.



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

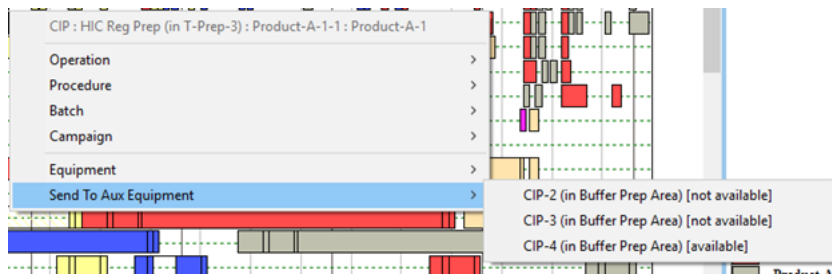


When chosen, the legend Go To option presents a selection of possible procedures to find.



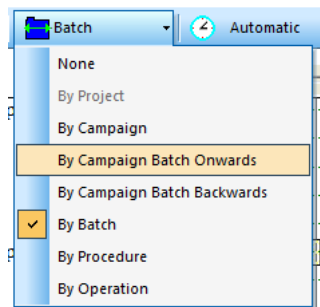
5.18 EOC Send-To Resource Improvements

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



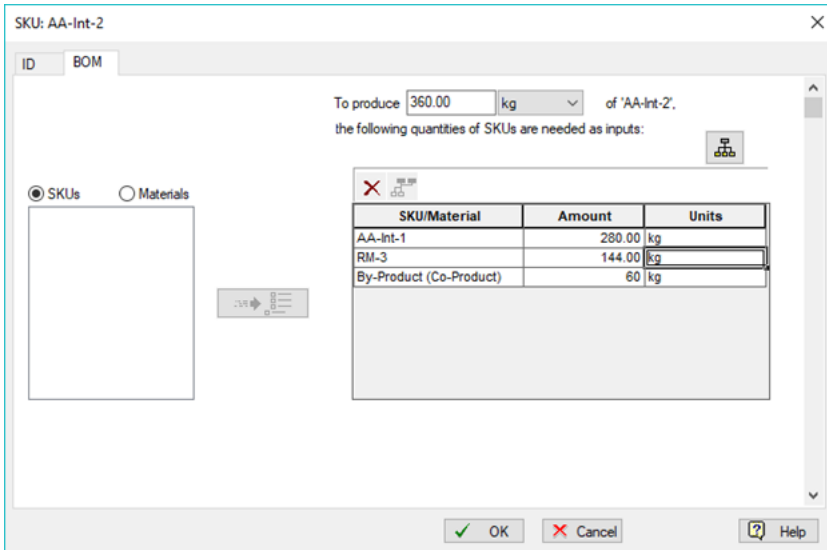
5.19 EOC Allow Drag/Drop of Partial Campaign

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



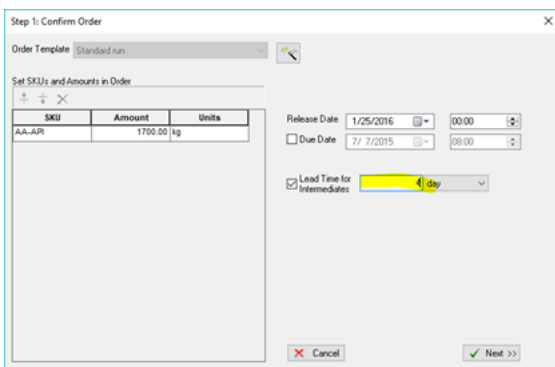
5.20 SKU Scheduling Allows Co-Products

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



5.21 SKU Lead Time for Intermediate in SKU Order

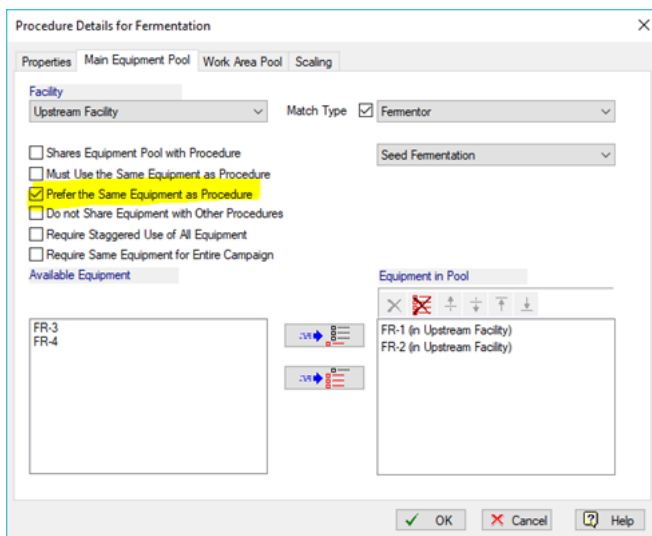
SchedulePro can now add lead time for planning intermediate SKUS.



5.22 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.



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

5.24 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.

5.25 Fix Multicomponent Stream Connection to MSS

The material demand on a material supply system by a multi-component stream is now correctly calculated.

5.26 Extended Workarea Policies

Work areas now have new constraints/usage policies. Work areas may now be restricted to:

- Activities that have the same recipe/SKU type
- Activities that have the same project
- Activities that have the same campaigns
- Activities in the same batch
- Any activities (no constraints)

Work Area Properties for Sterile Workarea

Properties

Identification

Name: Sterile Workarea Type: Work Area

Description:

Facility: Formulations Plant

Parallel Task Execution

Can Execute Multiple Parallel Procedures/Operations

Has Limit on Number of Parallel Uses: 1 Parallel Execution Possible Only for Same SKU

Work Area Usage Policy

Any Activities

Disp: Activities have the same recipe/sku type
Activities have the same project
Activities have the same campaign
Activities have the same batch

OK Cancel Help

5.27 Fix ODBC Recipe Database Issues

Some issues preventing the registration of the Recipe Database have been fixed.

5.28 Improve Counting for Discrete Amounts

A global setting in Edit/Preferences entitled **Use Fractional Entities** allows users to control how discrete amounts are treated.

If the option is selected, discrete material amounts are treated as real numbers. Durations based on discrete rates are based on fractional values.

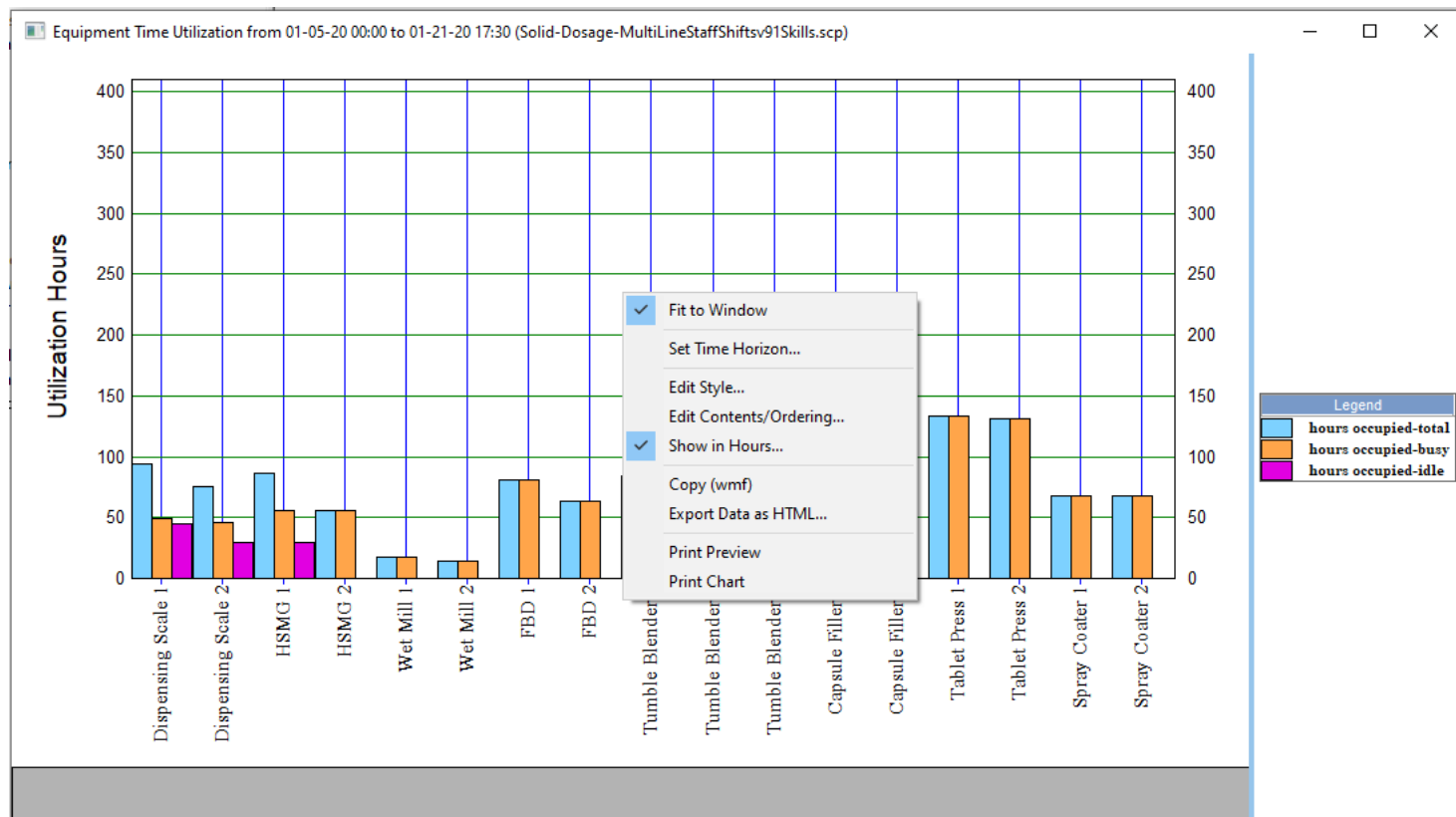
If the option is not selected discrete amounts are rounded to the next highest integer value before calculations are made.

5.29 Holding Equipment Included in Utilization Calculations

Equipment associated with material storage units can now be included in the equipment time utilization charts.

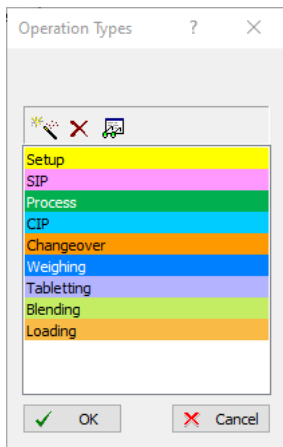
5.30 Utiliation Chart Can Display Hours

To show the equipment utilization in hours (rather than a percentage of the time horizon) select "Show in Hours..." from the context menu.

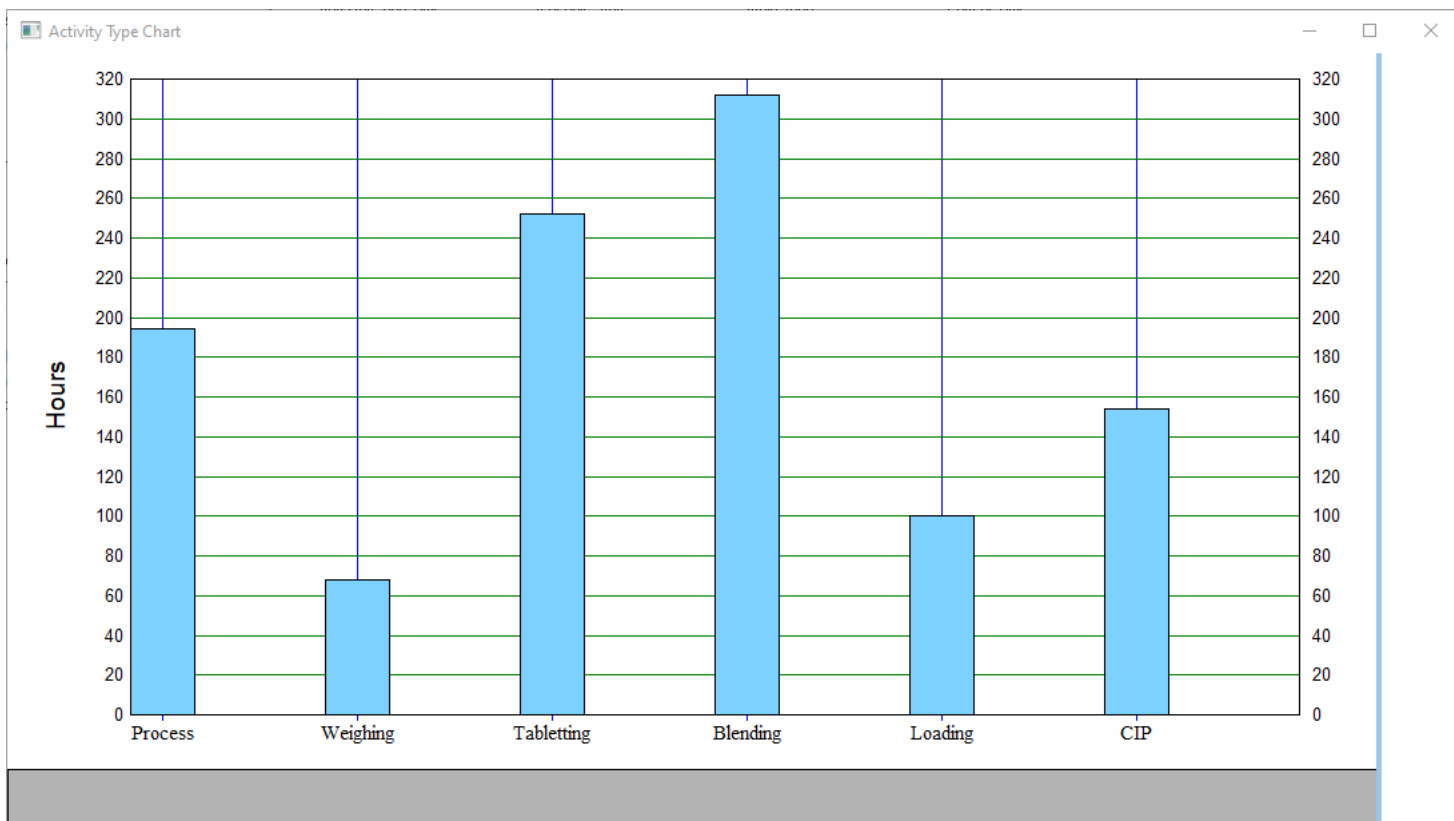


5.31 Activity Hours Chart

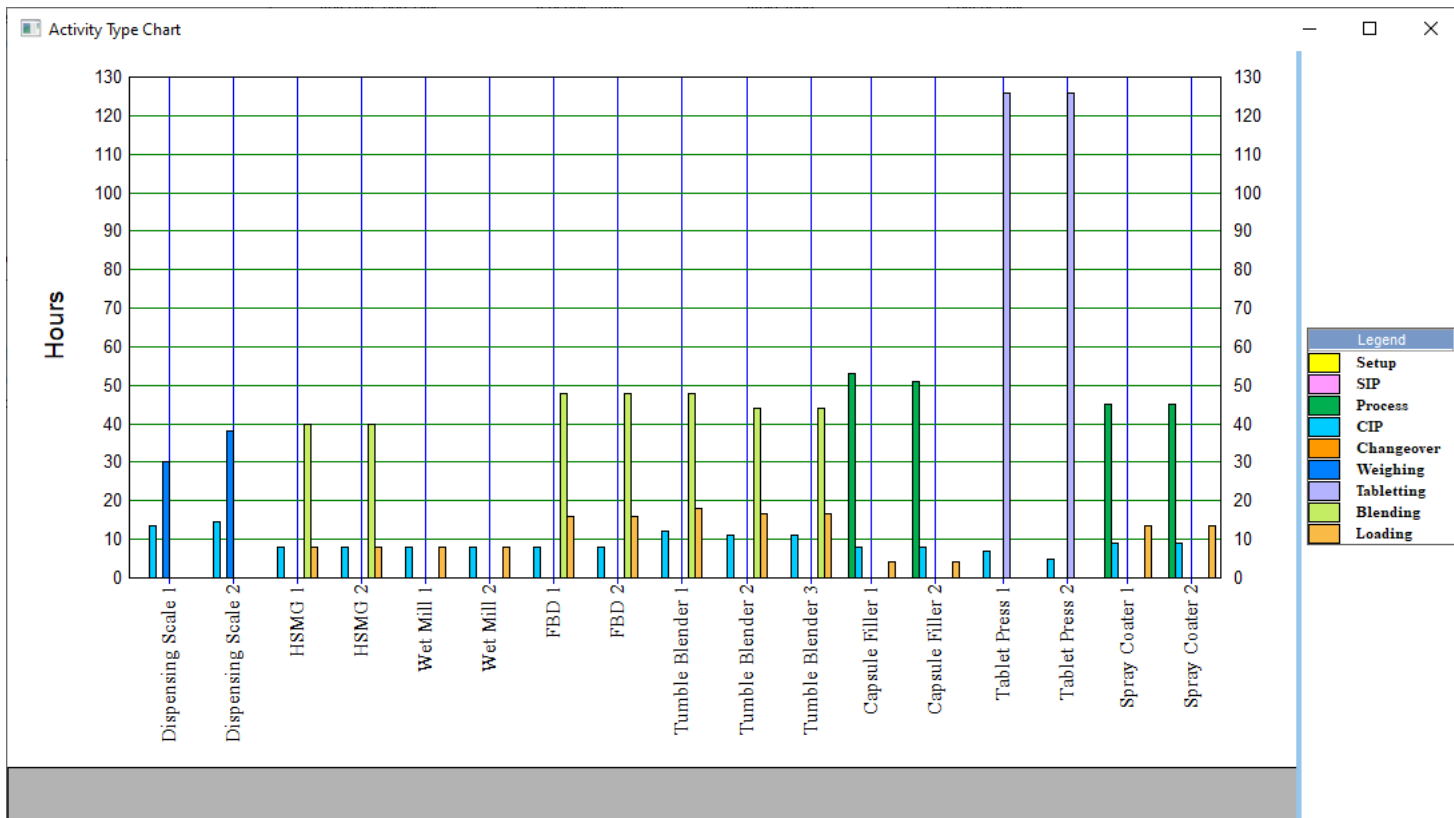
Operation types are user-defined type that may be assigned to operations in recipes. SchedulePro can now display a chart showing the total hours spent on each activity type. These may be displayed for the entire schedule or on a by-equipment/staff basis.



Activity Types



View/Activity Time Charts/Activity Time (Entire Schedule)...



View/Activity Time Charts/Equipment Activity Time...

5.32 Fix for Inventory Based Scheduling Issue

When inventory based scheduling also has a start-after constraint, the campaign will not attempt to start before the reference campaign condition.

5.33 Fix Units Change on Chart Copy/Paste

Fixed a problem with some resource demand charts changing units on copy/paste.

5.34 Activity Hours Report

Added a Tabular equivalent to the Activity Hours chart.

5.35 WebViewer SQL Server Fix for Duplicate Staff Rows

The Web Viewer no longer duplicates rows when multiple staff are assigned to the same operation. Note: this fix does not require a reinstallation of SchedulePro or the Web Viewer. Contact Intelligen for a SQL script update.

5.36 Fix Update Revert Issue

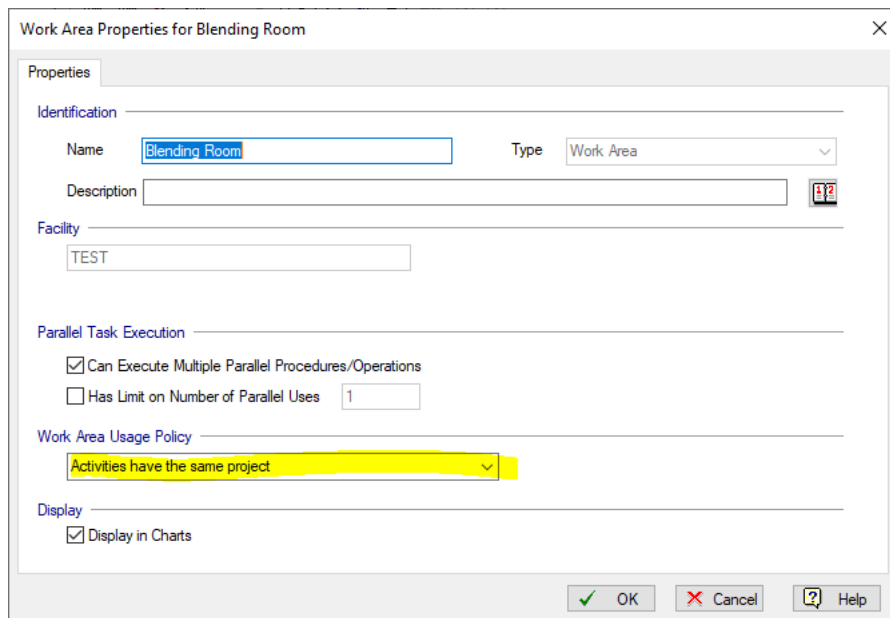
Fixed an issue causing some user-changes to be reverted upon calling "Resolve All Conflicts".

5.37 Fix Unresolved Conflicts Issue

Fixed an issue causing some resolvable conflicts to be left unresolved.

5.38 Work Areas Can be Reserved for A Project

Work Area reservation policies now include "Activities Have the Same Project".



The screenshot shows a dialog box titled "Work Area Properties for Blending Room". The dialog is divided into several sections:

- Identification:** Name: "Blending Room", Type: "Work Area".
- Description:** An empty text field with a help icon.
- Facility:** "TEST".
- Parallel Task Execution:** Can Execute Multiple Parallel Procedures/Operations, Has Limit on Number of Parallel Uses (1).
- Work Area Usage Policy:** A dropdown menu with "Activities have the same project" selected and highlighted in yellow.
- Display:** Display in Charts.

At the bottom, there are buttons for "OK", "Cancel", and "Help".

5.39 Improve Copy/Paste in Batch, Procedure and Staff List

These views now support copying the text to other applications.

5.40 Campaign Average Cycle Time Calculation Improvement

The average cycle time for a scheduled campaign is now calculated on the nominal, rather than absolute, batch starts. This makes cycle time reporting more consistent for recipes that may have operations with negative flex shifts.

Index

+

+/- Flex Shifts 30

A

Activity Hours Chart 49

Activity Hours Report 51

Ad Hoc Scheduling 33

Added Work Area Usage Policies 35

All Reports Have Show on Exit Option 14

Apply Outage Calendar to Selected Resources 44

Attention Code Tracking 27

B

Batch Message Management 10

C

Campaign Average Cycle Time Calculation Improvement 53

Campaign Level Scheduling Mode 43

Campaign Navigation Improved 6

Campaign Renaming for Campaigns in SQL Server 15

Campaign Scaling Limits In Recipe 30

Changed Operations 28

Completion Status Propagation 44

Critical Path Display 28

D

Dialog Size Improvement 47

Discrete Streams May Have a Bulk Quantity 16

E

EOC Allow Drag/Drop of Partial Campaign 45

EOC Search/Go-To Improvements 44

EOC Send-To Resource Improvements 45

Edit Tracking information in EOC. 20

Equipment Chart Color-by-Procedure 29

Equipment Chart Frame Coloring 8

Equipment Chart Time Measure 29

Equipment Staff Utilization Report Improvements 14

Equipment Used-By More Readable 6

Equipment-Dependent Streams 13

Excel Report 14

Exceptions for Repeating Outages 44

Extended Workarea Policies 48

F

Fix Multicomponent Stream Connection to MSS 47

Fix ODBC Recipe Database Issues 48

Fix Units Change on Chart Copy/Paste 51

Fix Unresolved Conflicts Issue 52

Fix Update Revert Issue 52

Fix for Inventory Based Scheduling Issue 51

G

Gantt Chart Equipment Occupancy Page Display Options 20

H

Holding Equipment Included in Utilization Calculations 49

I

Improve Copy/Paste in Batch, Procedure and Staff List 53

Improve Counting for Discrete Amounts 48

Improved Continuous Processing Options 27

Improved Cycle Time Estimate 13

Improved Elapsed Time Measurement in EOC 23

Improved Equipment Deletion 22

Improved Handling of Repeated Operation/Procedure Names 23

Improved Tracking Options 27

Improved Weekend Display 18

K

Key Date Reporting 40

L

Limited Update Mode 27

Line Charts Include Material and Resources 21

Linked Conditional Operations 18

M

MS Access (MDB) Report Improvements 15
 Make Equipment and Staff Updates 21
 Material Holding Resources 19
 Minimum Cycle Time for Event Based Campaigns 11
 Multi-Select Operations in Procedure View 22
 Multiple Inventory Plotting 26

N

New Examples 34
 New Examples Directory 25
 New Examples and Databases Location 25

O

ODBC Campaign Data Import/Export 17
 Operation Auto-Schedule now Optional 8
 Outage Color 19

P

Phase ID / Phase Entry ID 32
 Procedure Prefer to Keep Equipment Option 46

Q

QC Reporting 33

R

Recipe Editing in Gantt Chart 7
 Recipe Navigation: Procedure Drill Down 10
 Recipe Overview Dialogs are Sizeable 7
 Resource Charts May be Shown in Volume 17
 Resource Editing Options 33

S

SKU Based Report Text 31
 SKU Lead Time for Intermediate in SKU Order 46
 SKU Scheduling Allows Co-Products 46
 SQL Server Production Timing Update Improvements 15
 Save as Version 9.0 35
 Schedule Menu Restructured 4

Scheduled Operation Editing Improvements 2
 Scheduling Links Shown in Equipment Chart 3
 Scheduling Staff by Skills 38
 Share Staff with Other Operations 31
 Shift Notes 21
 Sort Campaigns in Campaign List 16
 Staff Email Notifications 41
 Staff Leveling 1
 Staff Load Leveling 40
 Staff Status Designations 36
 Staff Working Hours Limits 37
 Status Propagation for Completed Operations More Extensive 5
 Storage Unit Planning 47
 Support for WebTracker 10.1 22

T

Text File Import/Export Improvements 36
 Transfer Panel Alternate Equipment Compatibility 9
 Transfer Panel Compatibility to Other Procedures 12

U

Utiliation Chart Can Display Hours 49

V

V10.1 Bug fixes 23
 Variability Analysis Improvements 43
 Version 10 New Features 25
 Version 10.1 New Features 22
 Version 10.3 Features 13
 Version 11 Features 1
 Version 9.0 Enhancements 36
 Version 9.1 Enhancements 35

W

Web Tracker 10.3 New Features 19
 Web Tracker Support 25
 WebViewer SQL Server Fix for Duplicate Staff Rows 52
 Work Areas Can be Reserved for A Project 52

Z

Zero Duration Operations 43