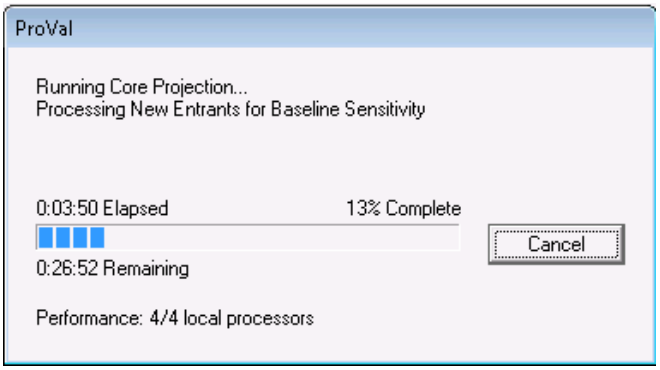
What's New in version 3.03 December 2011

ProVal version 3.03 introduces **multi-core computing for speed**, **easier navigation for sample lives**, and over 50 additional features listed below.

Speed

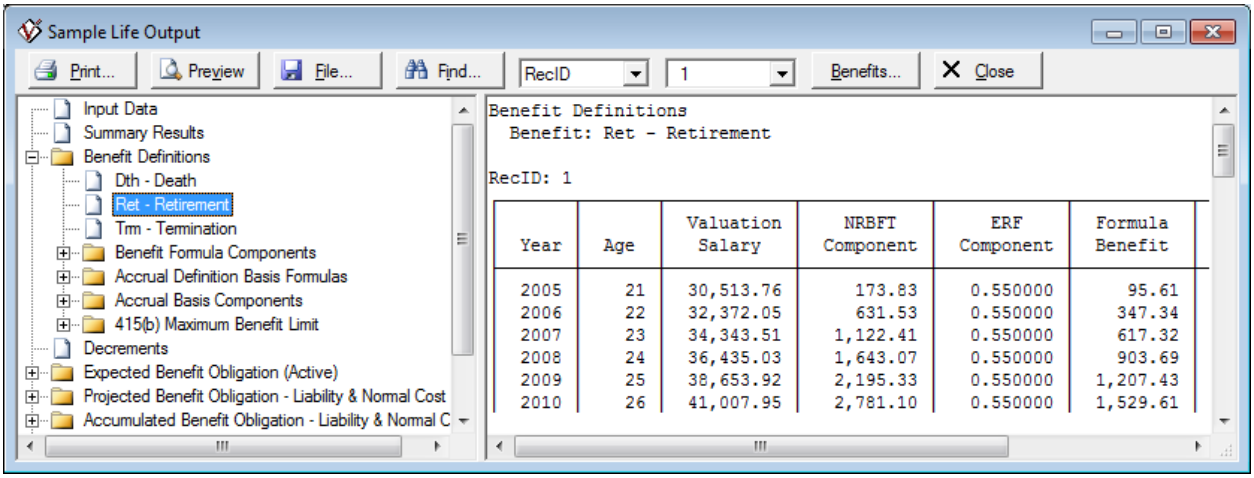
- **Multi-core computing.** Valuations, Core Projections and Gain/loss Analysis now run faster on multi-core computers (commercially available since 2005) by simultaneously running calculations on up to four local processors. For more, see Multi-Core Computing on page 12.



- **Inherently faster.** In addition to some across-the-board speedups, you'll find that Valuations, Core Projections, and Gain/loss Analysis that use lump sum components, determine optional form conversions based on interest and mortality, include a post-decrement death benefit for actives with the beneficiary determined at member death, or specify spouse age difference by table are faster. Average speedup is around 10%. In addition, accounting core projections are approximately 30% faster.

Sample Lives

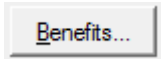
- **Easier navigation.** Sample life reports are now listed in a tree. Click on a report's name on the left side to display the report (the ↑ and ↓ arrow keys can also be used to move between reports). Many reports are grouped into folders. To expand or collapse a folder, click on ⊞ or ⊟ (or use the → and ← arrow keys). Alternatively, right-click on the tree and choose "Expand All" or "Collapse All".



Year	Age	Valuation Salary	NRBFT Component	ERF Component	Formula Benefit
2005	21	30,513.76	173.83	0.550000	95.61
2006	22	32,372.05	631.53	0.550000	347.34
2007	23	34,343.51	1,122.41	0.550000	617.32
2008	24	36,435.03	1,643.07	0.550000	903.69
2009	25	38,653.92	2,195.33	0.550000	1,207.43
2010	26	41,007.95	2,781.10	0.550000	1,529.61

Besides navigating among reports, you can easily:

- 

select an individual record to display (or <all>) and change the field used to identify records (RecID is the default),
- 

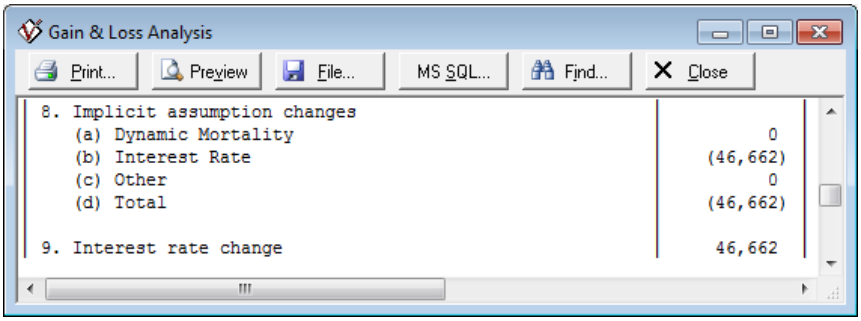
select benefits or decrement ages to display, and
- 

print or save one or more reports.

- Sample lives now skip benefits for which the selected sample life records are not eligible, resulting in less clutter. In extreme cases with hundreds (or thousands) of benefits, this runs faster and avoids potentially running out of memory.

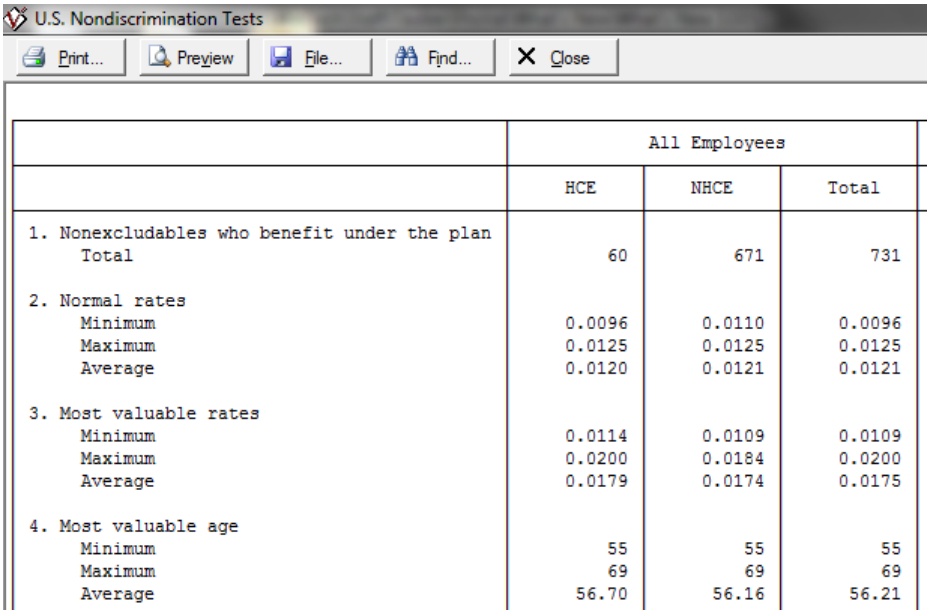
Gain/Loss Analysis

- **Interest rate assumption changes.** If you run gain/loss analysis with a different beginning of period and end of period interest rate, ProVal now automatically calculates the assumption change gain/loss. Only changes in the valuation interest rate are measured; other explicit assumption changes still produce unreconciled amounts.
- **Implicit assumption change splits.** Implicit assumption changes are now separated into three buckets: (a) dynamic mortality, (b) interest rate, and (c) other. An implicit assumption change is generated when merely changing the valuation date changes the assumption. An implicit dynamic mortality assumption change occurs when using one of ProVal's "dynamic" tables that change based on the valuation date. An implicit interest rate assumption change occurs when an interest rate varies based on duration from the valuation date (e.g., spot rates, segment rates). The "other" category is relatively rare, occurring in situations such as when pre- and post-decrement interest rates differ, a custom U.S. PIA operator is utilized with a salary override based on the valuation date, and mid-year changes in accrual rates are assumed as if effective on the valuation date (U.S. PPA funding assumptions only).



U.S. Nondiscrimination Testing

- **Accrual rate statistics.** The U.S. Nondiscrimination Coverage and General Tests tool now has an option to output accrual rate statistics. These are useful for analyzing current test results, and also for design analysis and assessing future results. To facilitate some of the statistics, the U.S. Nondiscrimination Accrual Rates tool now includes individual results for testing service at plan year end, testing age, and DC allocation during the measurement period.



	All Employees		
	HCE	NHCE	Total
1. Nonexcludables who benefit under the plan			
Total	60	671	731
2. Normal rates			
Minimum	0.0096	0.0110	0.0096
Maximum	0.0125	0.0125	0.0125
Average	0.0120	0.0121	0.0121
3. Most valuable rates			
Minimum	0.0114	0.0109	0.0109
Maximum	0.0200	0.0184	0.0200
Average	0.0179	0.0174	0.0175
4. Most valuable age			
Minimum	55	55	55
Maximum	69	69	69
Average	56.70	56.16	56.21

- The U.S. Nondiscrimination General Tests tool has a new option to use the normal rate as a minimum for the most valuable rate. This can occur, for example, for older participants (e.g., over age 70) due to interactions between standard normalization assumptions and plan actuarial equivalence. This option avoids an intermediate step to overwrite the individual results database using Define Field by Expression.

Pension Plans

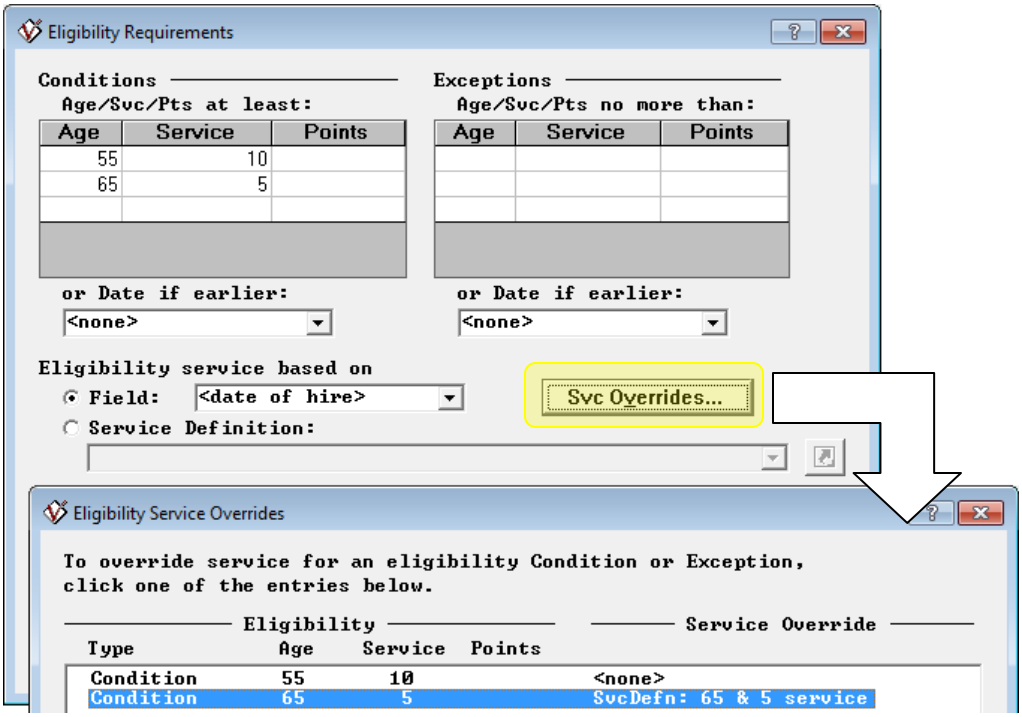
- **Eligibility for vested liabilities.** In Valuation Assumptions > Liability Methods (or Current Liability topic if non-PPA U.S. funding), when vested liabilities are calculated, there is a new option to determine eligibility for vested benefits at the valuation date, rather than at the first decrement age. This is useful if mid-year decrements are assumed.

U.S. Qualified Pension Plans

- **Disability mortality by coded field.** In PPA valuation assumptions, disability mortality rates can now vary by coded database field. This eliminates the need for a second run if assuming different disabled mortality for members who became disabled before and after 1995.
- **Deferred lump sum as optional form.** Deferred lump sums can now be set up as an optional payment form; this eliminates needing to set up a second benefit formula to value a deferred lump sum payment form. (This option is available in all pension modes, but commonly used for U.S. Qualified Pension plans.)
- In Valuation Assumptions > Regulatory Data > U.S. Maximum Benefits, there is a new option to apply the Plan's benefit payment frequency and timing when calculating 415 limit actuarial reduction and increase factors.
- The PBGC segment rates and the method used are now displayed in the PPA Development of PBGC Premium exhibit for Valuation Sets, Deterministic Forecasts, and Stochastic Trials.

U.S. Multiemployer Plans

- **Multiple eligibility service definitions.** The Benefit Definition Eligibility screen now allows multiple definitions of service for eligibility. (This option is available in all modes, but commonly used for multiemployer plans in U.S. Qualified Pension mode.)

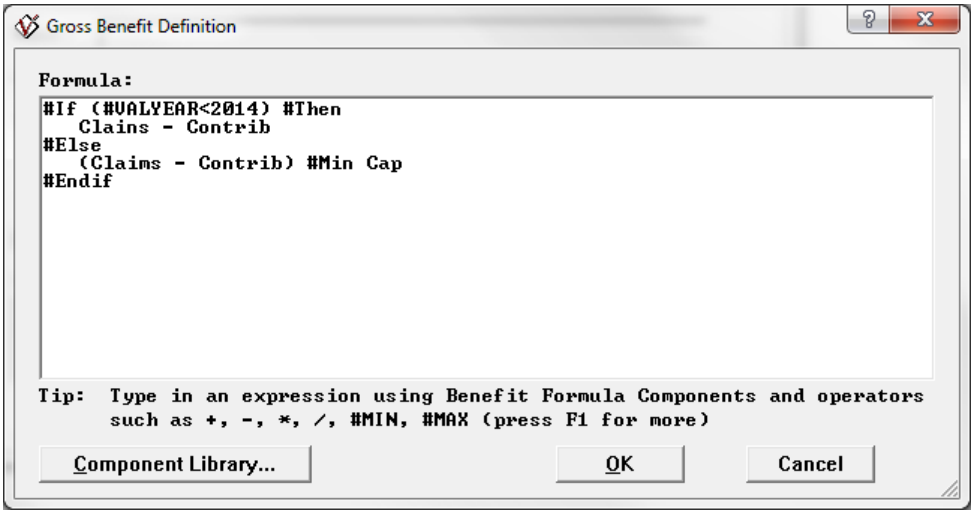


U.S. Public Pension Plans

- **Employee contributions and entry age normal.** A new option in Valuation Assumptions lets you calculate the employee contribution normal cost offset under Entry Age Normal as the expected contributions for the year. In other words, use the same normal cost offset for EAN as used for PUC and UC. (This option is available in all pension modes, but commonly used for U.S. Public Pension plans.)
- "Public Pension" mode has been renamed "U.S. Public Pension" to clarify the kinds of plans it is designed for.

OPEB Plans

- **Joint life annuity to member.** A new "Joint Life Annuity to Member" payment form pays an annuity to the member while both the member and spouse are alive. It is identical to the "Joint Life Annuity to Spouse" payment form, except that the gross and participant contribution formulas (including any table lookups) are based on the member's age, sex, etc. rather than the spouse's. It can also be used to value payments to the retiree after death of the spouse (reversionary to member), by valuing a "Life Annuity to Member" payment form with positive benefit B and a "Joint Life Annuity to Member" payment form with negative benefit –B.
- **#VALYEAR.** A new operator, #VALYEAR, returns the valuation year, projected in a forecast (e.g., 2018). This operator is available in all modes, but may facilitate the measurement of plan amendments in OPEB core projections. For example, in a core projection with an initial valuation date of 1/1/2012, the benefit formula pictured below will return "Claims – Contrib" for the first two projection years (2012 and 2013) and "(Claims - Contrib) #MIN Cap" for later projection years. *Caution:* Although this will produce the right liabilities and reflect the amended plan beginning with the 2014 valuation, ProVal will not set up a prior service cost (or any special amortization) to reflect this amendment. Rather, the change in liability will flow through to gain and loss.



- Sample life detail is now available for the #DECAGE, #DECPTS, #DECSVC, and #PMTAGE operators.
- The calculations of expected future service to retirement and full eligibility (as well as active life expectancy) now consider whether a non-zero benefit is payable for each decrement age, rather than assuming that an employer benefit is provided simply because eligibility conditions have been met. Consider a plan that only provides pre-Medicare coverage, but assumes some decrement ages at or beyond Medicare coverage age with a zero benefit. Total expected future service (TEFS) will now be decreased by excluding ages with zero benefits. This change will also affect average expected future service (AEFS), but could result in either an increase or decrease depending on the relative reduction in TEFS (numerator) vs. the number expected to receive benefits (denominator). This affects OPEB plans with zero benefits only; it has no impact on OPEB plans with non-zero benefits at all eligible ages.

Canadian Registered Pension Plans

- **Letters of Credit.** A new option has been added that allows letters of credit to be applied towards solvency deficiency payments; this is helpful for plans that have letters of credit and are operating under Alberta or British Columbia provincial law. Previously letters of credit were always added to the solvency assets.
- New options have been added that allow more flexibility in the application of actuarial and solvency gains to existing amortization bases, including a new option that allows ongoing bases to be adjusted during the remaining solvency period.

German Pension Plans

- **Post-termination decrements and benefits.** Disability, death, and retirement decrements can now be applied after termination for:
  - Active participants expected to terminate
  - Current terminated vested participants

  The associated post-termination benefits depend on service at termination and at second decrement (disability, death, or retirement), incorporating customizable legal vesting proration.
- **PSVaG liability**. A new liability that incorporates PSVaG benefit caps is now available in Tax/Funding Valuations and Core Projections. Necessary regulatory data for PSVaG Liability calculations is now built into ProVal, specifically the published Average Income level for former West and former East Germany.

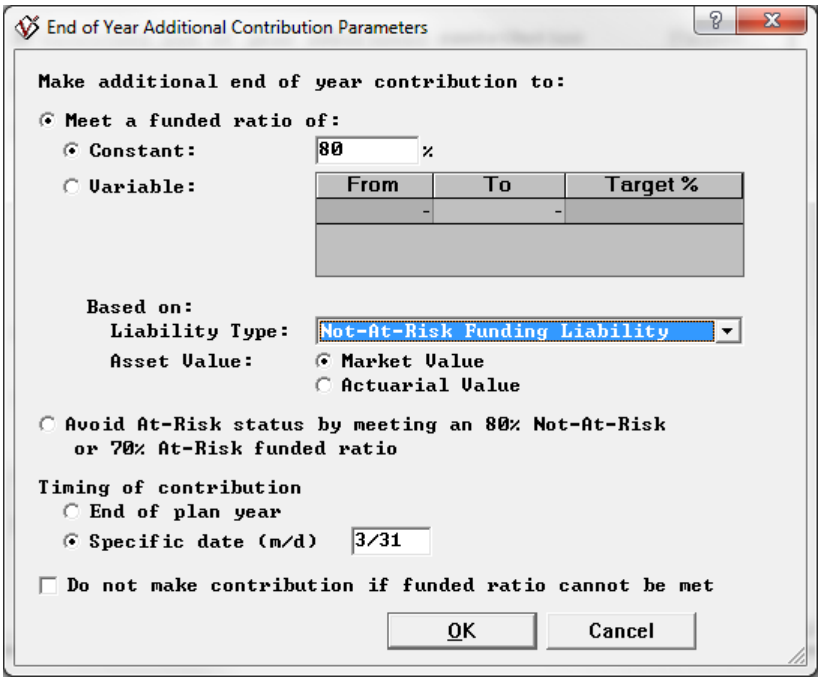
For more information, see Enhancements to German Pension Mode on page 14.

Netherlands Pension Plans

- COLAs now apply to post-decrement death benefits with the beneficiary determined at member death. (This was actually included as an update to version 3.02, but mentioned here in case you missed it.)
- The "Post-Decrement Death Benefit" payment form now allows the beneficiary to be determined at the earlier of member death or a given member age (generally the member's commencement age). This allows spouse benefits to be valued using a single payment form, rather than requiring both the joint life annuity payment form (for death after commencement) and post-decrement death benefit payment form (for death in deferral). In addition, you can now explicitly specify that the spouse's benefit commences immediately on member death and that coverage never ceases.

Forecasting

- **End of Year Contribution Timing.** In PPA Asset & Funding Policies when the additional contribution is based upon a funding liability measure, a date (m/d) can be specified for the timing of the contribution.



- Some additional output variables have been added to the stochastic output dialogs, most notably employee contributions in U.S. Public, Universal, and Canadian pension modes, additional accounting information in all modes, and additional PPA output variables in U.S. Qualified Pension mode.

Capital Market Simulations

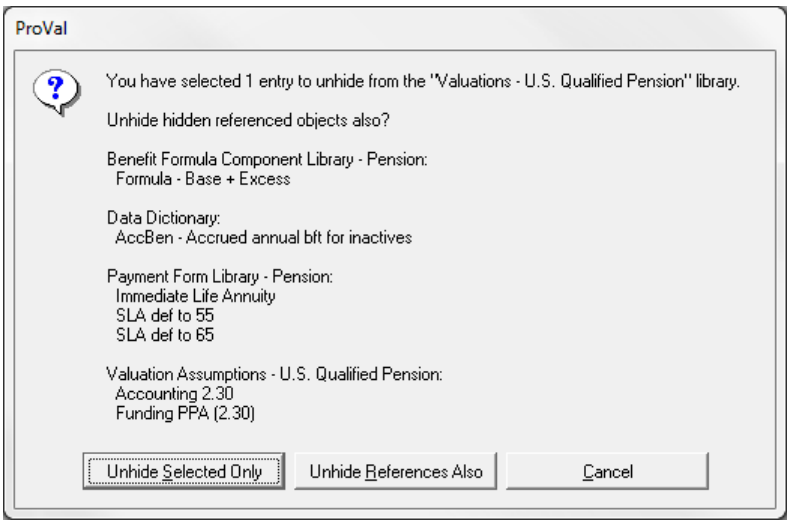
- Custom capital market simulators will now be populated with returns if switching to "Custom" within an executed simulation. This avoids having to export and import returns just to add a new asset class via import. Additionally, a custom simulation can now support yield curve stochastic forecasts as long as it started as an executed "Multi-Factor Term Structure" or "Explicit Corporate Yield Curve" simulation.

Interface

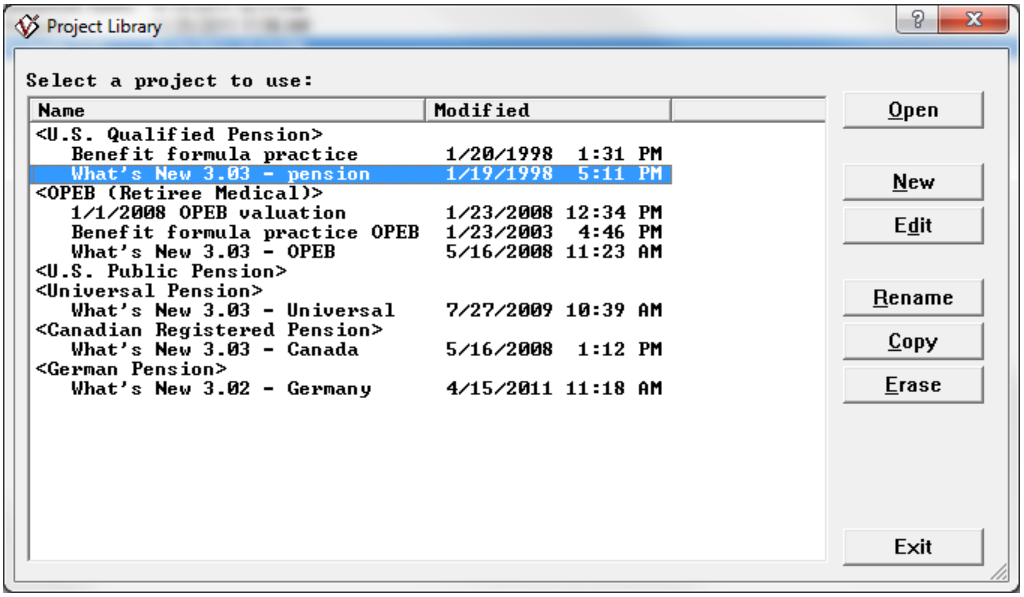
- Field name drop-down lists now let you type in the field name directly (previously, the best you could do was type the first letter repeatedly) as an alternative to picking it from the list. You

can stop typing when you get to the field you want; ProVal autocompletes the field with the first match as you type.

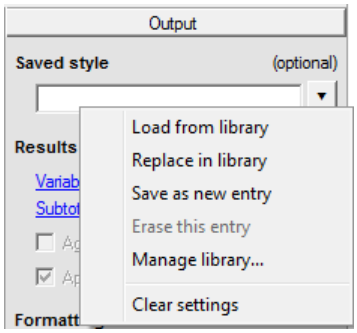
- When unhiding an object, ProVal now offers to unhide all referenced objects. For example, if you unhide a Valuation, ProVal will also offer to unhide the referenced Valuation Assumptions, Plan Definition, Benefit Definitions, etc.



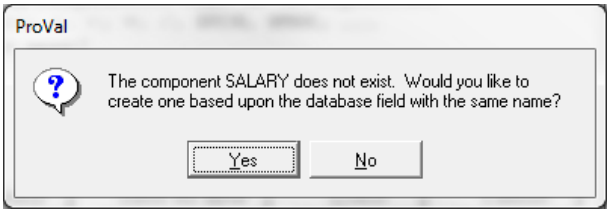
- The Project Library now utilizes the same interface found in other ProVal libraries. Among other things, multiple projects can now be deleted at once.



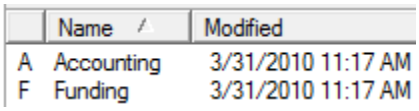
- A new "Clear settings" option in inverted libraries (e.g., output, descriptive statistics, frequency tables, etc.) lets you quickly "start over" to create a new output style.



- For Benefit Formula Components and Accrual Basis Components that vary by coded field, values for new codes can now be filled in without erasing prior results.
- ProVal now offers to create a database field benefit component if a reference is made to a database field in a subformula (just as it already did in a Benefit Formula).



- A new column in the Valuation Assumptions Library displays the type (F = funding, A= accounting).

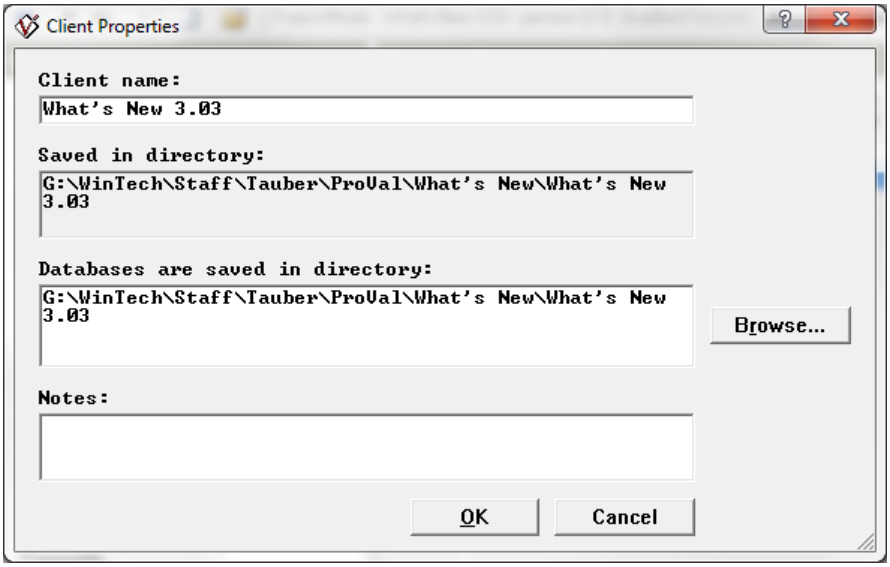


- A new column in the Custom Operators Library displays the type (SALARY, FAS, PIA, or CVCP).
- The File > Options command now lets you to select a font to view entries on ProVal's main screen (this command was previously found at File > System Maintenance > Options). For example, you might increase the font size to make entry names easier to read (tip: first try adjusting font size by using Windows Control Panel, so that the change applies to all applications, not just to ProVal). Additionally, you might select another font. For example, if your entry names rely on alignment for easy readability, you might select a fixed width font such as "Courier New", as displayed for these two (Valuation Assumptions library) entries:

```
1/1/2009 NEW ASSUM NQ LS
1/1/2009 OLD ASSUM Q  ANN
```

- Throughout ProVal, "FAS 87/158" and "FAS 106/158" have been renamed "ASC 715"; "FAS 35" has been renamed "ASC 960".
- Keyboard shortcuts
  - Links in the Output Panes are now accessible using the Tab key.

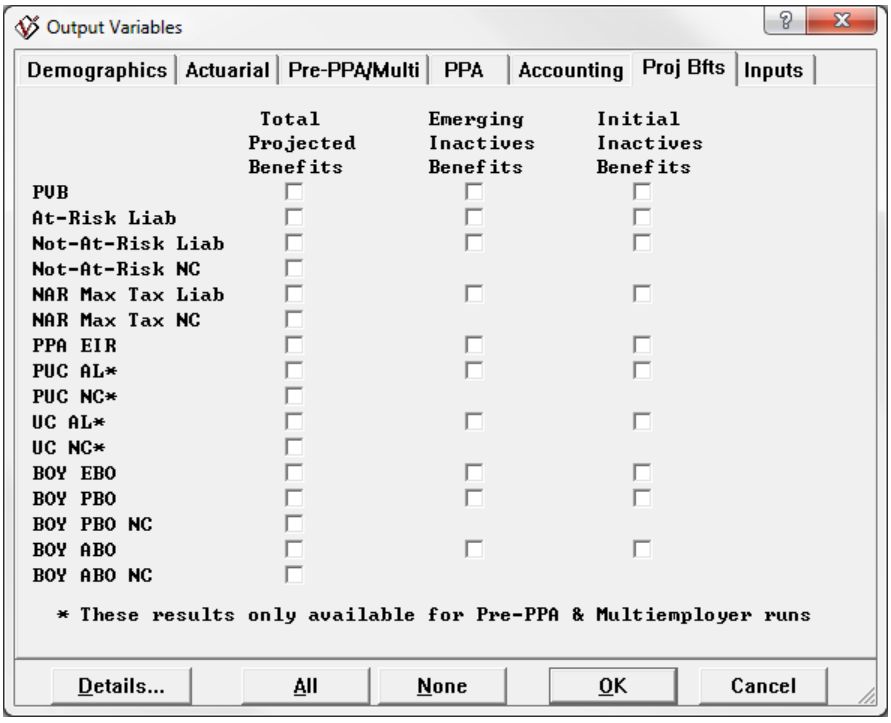
  - The Compare button is now consistently accessed with Alt+M throughout ProVal.
- All fields imported will automatically unhide after importing data. Previously, only new fields added to the data dictionary would unhide. Similarly, the fields PctMale, CAPctMale, and Count will automatically unhide after grouping data.
- Client level notes can now be added in File > Properties.



- In the Payment Form library, the "Modified Cash Refund Annuity" dialog box now has a backdoor button to the Benefit Formula Component Library, so you can edit the component that defines the guaranteed amount on the fly.
- In List Objects or input listings, the table of contents will now display only selected objects by default (previously, the default was to display all objects).

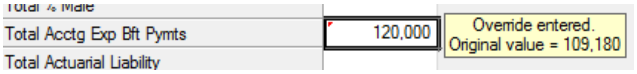
Output & Reporting

- In Valuation Output, projected benefit payments are now available by detail (e.g., by benefit, by pre/post-Medicare splits in OPEB mode, etc.).
- In Core Projection Output, projected benefit payments are now available, allowing you to compare and add results across multiple runs. Previously, projected benefit payments were only available for a single Core Projection at a time via the View button.

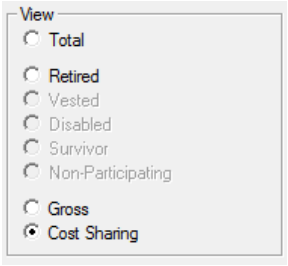


Report Writer

- When overrides are entered, a new right-click menu option lets you "Restore original value of x".



- OPEB data is now available by gross and cost sharing splits for inclusion in your reports.



System

- Batch log messages older than a specified number of days can now be deleted selectively (Batch Execution > View Prior Batch Messages) or automatically when packing files (File > Options, Pack). By default, messages older than 30 days will be deleted automatically in conjunction with file packing. These measures will help prevent the batch message log from growing without bound and contributing to hitting the 4GB limit (FILE FULL).

Census Data

- In Spreadsheet Edit, there is a new option on the View menu to "Clear Settings." This restores all settings except zoom and transpose to their defaults (setting the view to all fields, all records, etc.).
- For "Soc. Sec. #" type fields, ProVal now disallows non-integer values via import, manual entry, or Define Field by Expression.

Experience Studies

- A new option in the Databases & Census Specification topic lets you omit the list of RecIDs with data defaults from the output.

Batch Server

- The Batch Server's status report now lists progress information (e.g., 75% complete) of any job currently running.

Online Training

- An online training course entitled "Introduction to Forecasting" has been added at www.winklevoss.com/webtrain. Learn how to group data and enter assumptions to project liabilities. Then enter deterministic and stochastic assumptions to calculate future contribution and expense amounts. Online training courses are free, interactive, and can be completed at your own pace.

ProVal PS

- A "Prompt before updating files" command has been added to the Options menu.

ProVal PS API

- The 'fsGetLiabsDims' call has been extended to return sensitivity information.
- A new 'fsGetOUTX' call returns detailed scenario results.

For more information, see "ProVal PS API Users.doc" (distributed to ProVal PS API users only).

Changes Log

- Be sure to read the changes log (see the "Changes Log.Doc" file in the ProVal directory) about updates to certain calculations that may change results.

WinTech

Two Greenwich Office Park
Greenwich, CT 06831

tel: (203) 861-5530
fax: (203) 861-5531
email: support@winklevoss.com
website: www.winklevoss.com

Multi-Core Computing

ProVal version 3.03 includes a major performance enhancement. Valuations, Core Projections and Gain/loss Analysis now run much faster on multi-core computers by simultaneously running calculations on up to four local processors. In prior versions, ProVal would only use a single processor regardless of the number of processors available.

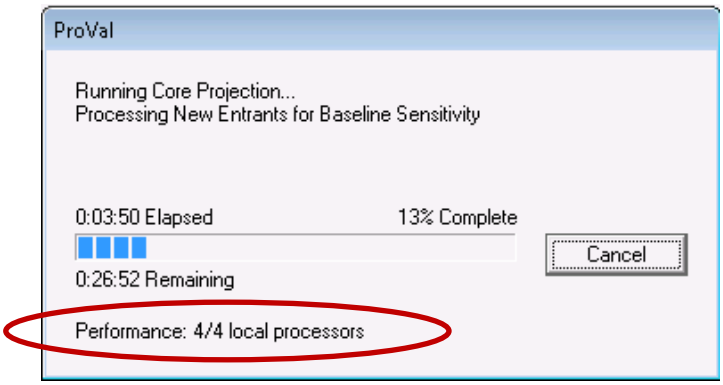
How much faster will my runs be?

Longer runs will show the most improvement. Runs which currently take a short amount of time, such as less than two minutes, may not see any improvement (or be slightly slower).

For these longer runs, the number of processors (P) is the primary factor that affects performance. You can estimate how much faster by using the equation 1 / (0.05 + 0.95 / P). For example, a long run will be about 1.9x faster on a computer with 2 processors and about 3.5x faster with 4 processors. Note that if the processors are using Hyper-Threading (see discussion below), the number P should be decreased by dividing by 1.9.

What do I need to do to take advantage of multi-core computing?

Nothing. ProVal will automatically distribute runs to up to four local processors. The first thing you will notice is additional performance information on progress dialogs.



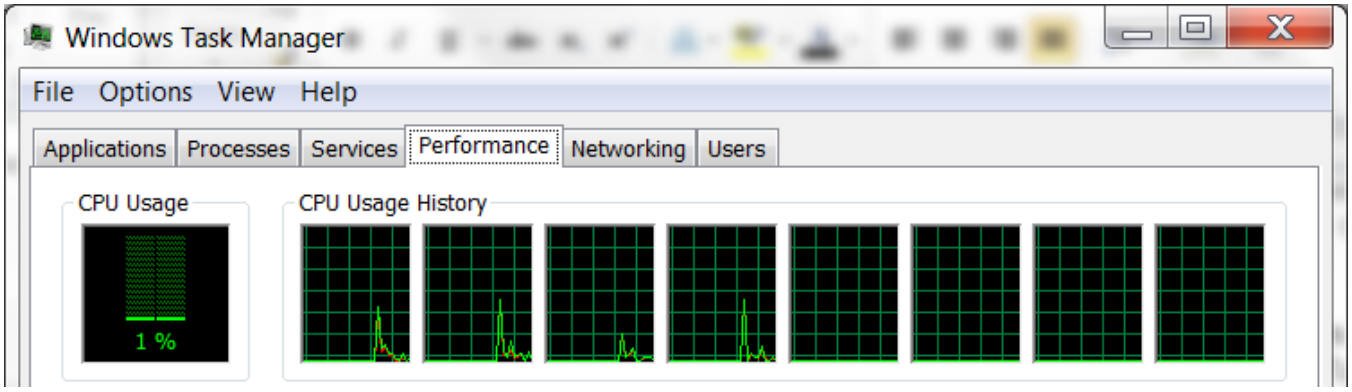
ProVal will limit the number of processors to ensure a minimum of 700MB of memory is available to each processor. If for some reason you would like to override the number of processors that ProVal distributes work to, add the MaxThreads parameter to the [Cloud] section in your PROVAL.INI file.

```
[Cloud]
MaxThreads=2
```

You might want to reduce MaxThreads to ensure that other applications have sufficient CPU resources while ProVal is running in the background. You might also choose to increase MaxThreads if you believe ProVal's 700MB per processor default is too conservative for the complexities of your benefit plans. A computer's total memory will be split among the individual processors (note that 32 bit operating systems are limited to 4GB of memory, whereas 64 bit operating systems have a much higher limit).

How do I determine how many processors my computer has?

An easy way to determine the number of processors on your computer is to view the Task Manager. There are at least two ways to view the Task Manager: either press Ctrl-Alt-Delete and select Start Task Manager, or right click on the taskbar (runs across the bottom of your window) and select Start Task Manager. Once the Task Manager is started, select the Performance tab. You should see a window similar to below. The number of processors equals the number of mini-graphs under CPU Usage History. In the case below, there are 8 processors on the computer.



Hyper-Threading

An interesting and recent development with processors is a feature known as Hyper-Threading. Intel® Hyper-Threading Technology is a hardware feature supported in many Intel® architecture-based server and client platforms that enables one processor to run two software threads simultaneously. Basically, if the computer has installed Intel Hyper-Threading hardware, it will report to Windows twice the number of actual processors.

In the case of the computer above, Windows believes there are eight processors but in reality there are four with Hyper-Threading.

The relevance of Hyper-Threading to ProVal's new multi-core enhancement is for estimating performance improvements. Two Hyper-Threaded processors have a throughput of about 1.05 processors (not 2). Hence, when estimating the speed up using the equation above, the number of processors P should be decreased by dividing by 1.9 (1.9 = 2 / 1.05).

For even more speed, can I harness processors on networked computers?

Not yet. We're working on extending parallel processing to multiple computers using WinTech's Grid Platform (expected early in 2012). WinTech's Grid Platform will allow ProVal runs to be distributed beyond the local machine to other computers on a network.

We expect the equation above can still be used to estimate the increased speed with these additional processors. For example, a run might be about 6x faster with 8 processors and 12x faster with 30 processors.

The Grid Platform will be created by installing Grid Agents on any computer that is willing to participate. The Grid Platform is designed with queuing logic which controls how frequently Grid Agents switch between competing runs so no one run is unduly penalized by heavy loads. Also, the Grid Platform is designed with failovers among Grid Agents. In the event a Grid Agent computer shuts down while running slices of a run, the stranded slices are placed back in the pool for other Grid Agents or the local computer to resume processing.

WinTech's Grid Platform is a separate product and will require additional licensing. Contact your WinTech sales person for additional information.

Enhancements to German Pension Mode

ProVal 3.03 includes many enhancements to German Pension mode in ProVal, including the following features:

- **Post-termination decrements and benefits.** Disability, death, and retirement decrements can now be applied after termination for:
  - Active participants expected to terminate
  - Current terminated vested participants

  The associated post-termination benefits depend on service at termination and at second decrement (disability, death, or retirement), incorporating customizable legal vesting proration.
- **PSVaG liability**. A new liability that incorporates PSVaG benefit caps is now available in Tax/Funding Valuations and Core Projections. Necessary regulatory data for PSVaG Liability calculations is now built into ProVal, specifically the published Average Income level for former West and former East Germany.

Active Participants with Post-Termination Benefits

Valuation Assumptions

Termination Rates can now be specified for Active Participants in Valuation Assumptions. (Previously, Termination Rates were forced to <no rates>.)

Benefit Definitions

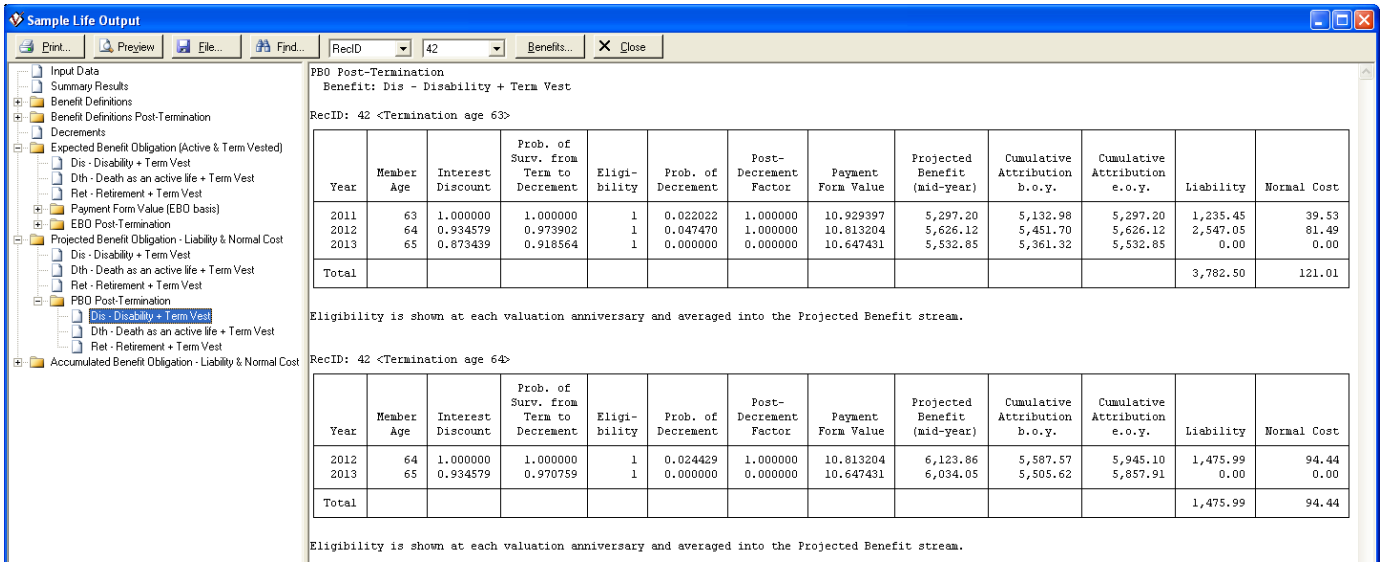
Post-termination benefits utilize the same Benefit Definition specified for disability, death, and retirements from active service. Although the same benefit *formula* is used for decrements from active service and post-termination decrements, the benefit *amount* differs. Post-termination benefits incorporate legal vesting proration, as discussed in the Vesting section below.

Sample Lives

Liability reports (e.g. for PBO and ABO) now contain additional columns explicitly showing the probability of a prior Termination, and the Post-Termination Liability and Normal Cost in each case:

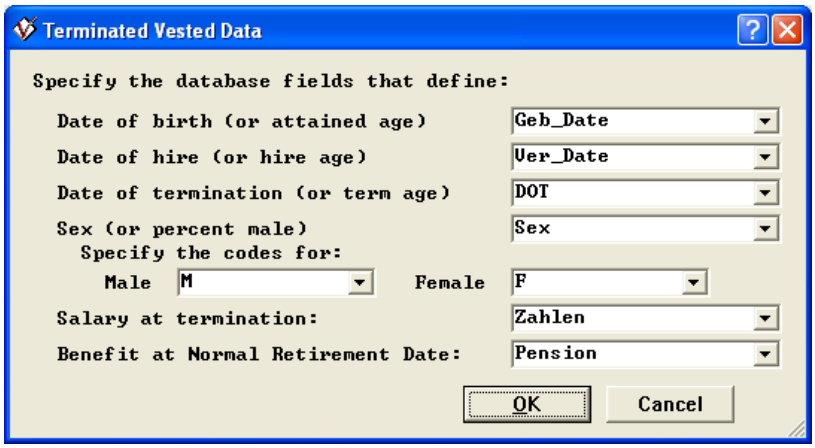
	Liability	Normal Cost	Prob. of Termination	Liability at Termination	Liability Post-Termination	Total Liability	NC at Termination	NC Post-Termination	Total Normal Cost
3	2,689.16	86.03	0.010000	3,782.50	37.82	2,726.98	121.01	1.21	87.24
5	2,648.10	169.44	0.010000	1,475.99	12.96	2,661.06	94.44	0.83	170.27
2	0.00	0.00	0.000000	0.00	0.00	0.00	0.00	0.00	0.00
	5,337.26	255.48			50.78	5,388.04		2.04	257.52

Separate Post-Termination reports are also available to show the development of the "Liability at Termination" and "NC at Termination" values:



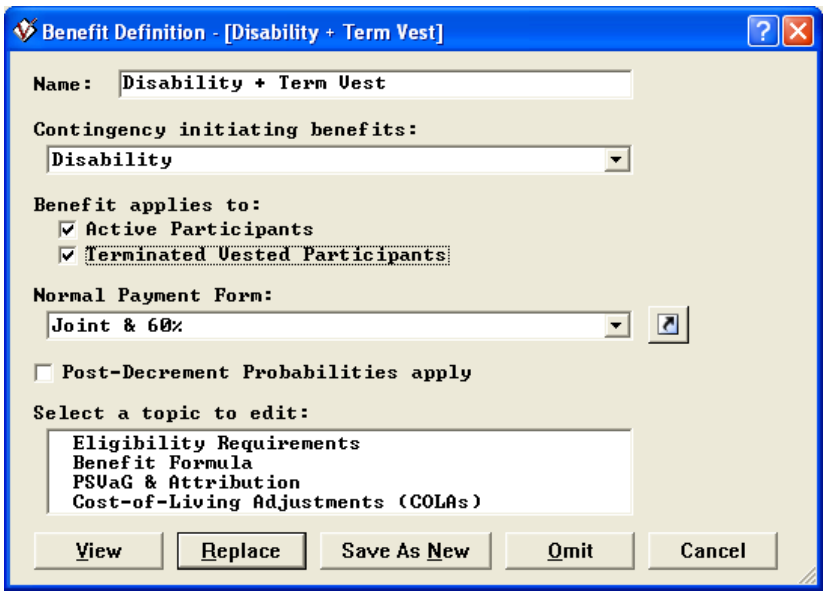
Terminated Vested Participants

Census Specifications



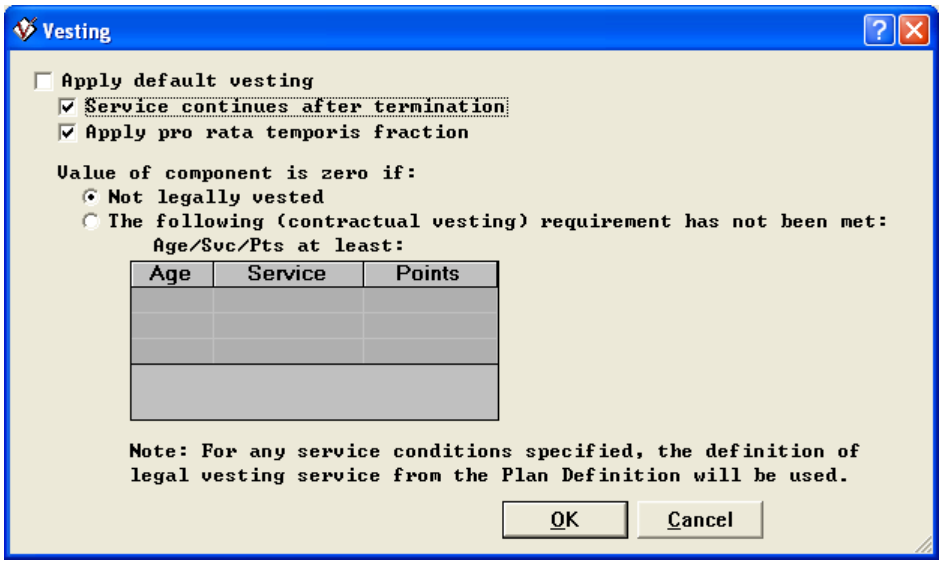
Census Specifications in German mode now contain a topic for Terminated Vested Data. Here, data is specified similar to Active participants. One data item that is unique to Terminated Vested Participants is the Benefit at Normal Retirement Date. This is used in Benefit Formulas that reference the #NormToNRB operator (described below) to normalize estimated benefits to a known amount. Note that this can be set to "<none>" if no corresponding data is available, or the specified database field can be left blank for the participants for whom information is unavailable.

Benefit Definitions



Benefit Definitions can now be designated as applying to Active Participants, Terminated Vested Participants, or both. We expect that in many cases, Benefit Promises will apply the same benefits to Active and Terminated Vested Participants, but benefit programming can be separated if additional flexibility is required. For any Benefit Definition that applies to Terminated Vested Participants, the #NormToNRB operator is available. When used, it normalizes its right argument so that at Normal Retirement Date (as specified in the Benefit Promise) it equals the Benefit at Normal Retirement Date (as specified in the Census Specifications). The same ratio is applied to other decrement ages, retaining the underlying accrual pattern. For further information, please see the article in ProVal Help entitled "#NormToNRB".

Vesting

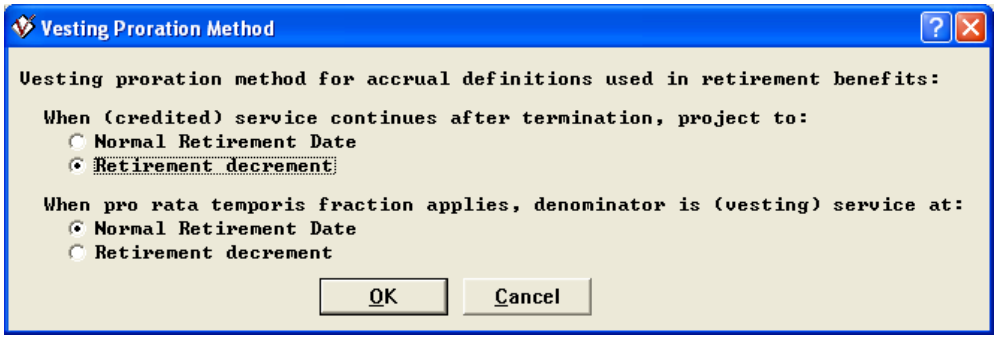


Accrual Definitions now contain a Vesting topic in German Pension mode, where you can specify vesting treatment for the component. When different components are combined within a single Benefit Formula, each Benefit Formula Component can use its own customized Vesting parameters for:

- Whether service continues after termination (e.g. traditional defined benefit) or is frozen upon termination (e.g. contribution-related benefits)

- Whether a pro rata temporis fraction applies to the component after termination (e.g. traditional defined benefit) or not (e.g. contribution-related benefits)
- Whether the component should be zero when not legally vested, or whether alternative contractual vesting applies

Benefit Formulas with multiple layers (e.g. grandfathered benefits or minimums) can thus be programmed through a combination of Benefit Formula Components with various vesting options. Note that the option to "Apply default vesting" treats final average and basis only components with traditional defined benefit vesting parameters, and career average and cash balance components with contribution-related vesting parameters. For further information, please consult the article in ProVal Help entitled "Accrual Definition Vesting Topic".



Benefit Promises now contain parameters for legal vesting proration (i.e. the "pro rata temporis" factor that is applied after termination) that is applied to each underlying accrual definition for Retirement benefits:

- Whether credited service is projected to the Normal Retirement Date, or to the Retirement decrement
- Whether the pro rata temporis denominator is the vesting service at Normal Retirement Date, or at the Retirement decrement

Note that when credited service is projected to the Normal Retirement Date, the denominator must also be the service at Normal Retirement Date.

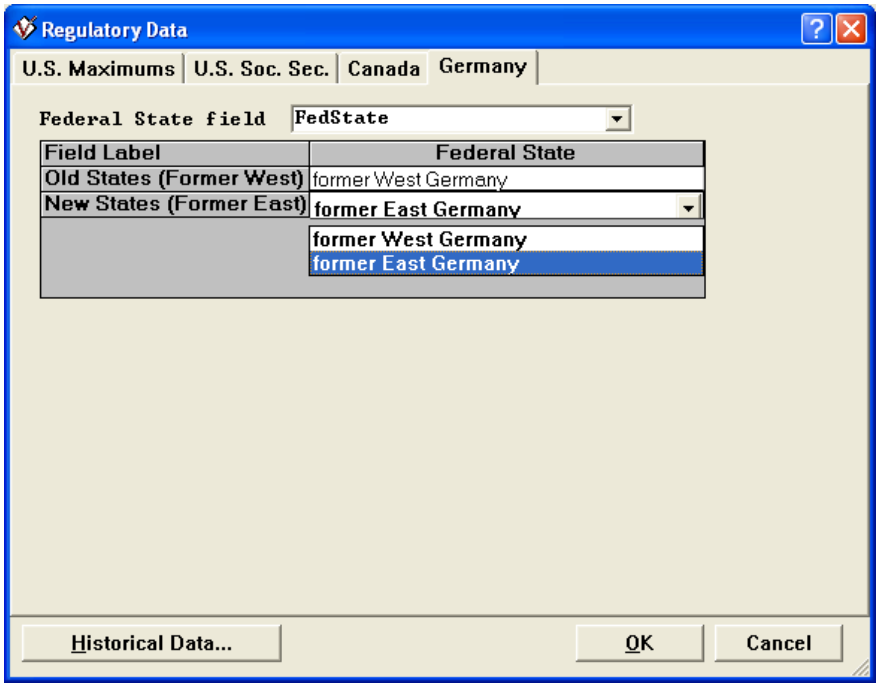
PSVaG Liability

Methodology

Valuation Assumptions now contain a topic titled "PSVaG Liability" which allows for the calculation of liability according to this method. For further details, please consult the Technical Reference in ProVal Help entitled "Teilwert and PSVaG Liability."

Regulatory Data

Necessary regulatory data for PSVaG Liability calculations is now built into ProVal, specifically the published Average Income level for former West and former East Germany. Note that when PSVaG Liability is calculated, the old federal state for each participant must be specified in the Regulatory Data topic of Valuation Assumptions. For further information, consult the Command Reference in ProVal Help entitled "Regulatory Data."


Regulatory Data
U.S. Maximums
U.S. Soc. Sec.
Canada
Germany
Federal State field
FedState
Field Label
Federal State
Old States (Former West)
former West Germany
New States (Former East)
former East Germany
former West Germany
former East Germany
Historical Data...
OK
Cancel