

**First information request concerning the  
Prudent Harmonised Reduced Set of Scenarios  
(PHRSS) framework, 2023**

***Technical specifications***

**Table of contents**

<b>1. Purpose of the document</b>	<b>1</b>
<b>2. Context of the information request</b>	<b>1</b>
<b>3. Overview of the first information request</b>	<b>3</b>
<b>4. Participation to this information request</b>	<b>3</b>
<b>5. Economic scenarios provided</b>	<b>3</b>
<b>6. Specification of the requested information</b>	<b>5</b>
<b>6.1. Outline</b>	<b>5</b>
<b>6.2. Conventions and assumptions to be used for the submissions</b>	<b>5</b>
<b>6.3. Scope</b>	<b>6</b>
<b>6.4. Directions for the « BE own calculations » tab</b>	<b>6</b>
<b>6.5. Directions for the « BE with PHRSS » tab</b>	<b>7</b>
<b>6.6. Directions for qualitative questionnaire</b>	<b>7</b>
<b>7. Deadline and practical aspects of filling out the data request</b>	<b>8</b>

**1. Purpose of the document**

The aim of this document is to provide technical specifications for the insurance undertakings participating in the first phase of the EEA-wide information request carried out by EIOPA in context of the PHRSS framework. It should be considered carefully before filling out the response templates.

**2. Context of the information request**

*Valuation of liabilities with options and guarantees – EIOPA’s proposal for a PHRSS framework*

A stochastic valuation is the most accurate method for the valuation of contracts with options and guarantees and, indeed, deterministic valuation tends to underestimate the best estimate of such contracts since it does not consider the time value of options and guarantees (TVOG). However, a stochastic valuation is more complex and costly to implement, since it requires an economic scenario generator and an actuarial platform that allows for a stochastic valuation.

Before this background, as part of its opinion on the Solvency Review EIOPA has proposed a new valuation methodology as a proportionality measure for undertakings that have liabilities with options and guarantees but that currently don’t use stochastic valuation. This new methodology is intended to smooth the path between deterministic and stochastic valuation for small and less complex undertakings with limited resources. Under this methodology, undertakings assess the TVOG on basis of a Prudent, Harmonised, Reduced Set of Scenarios (PHRSS) published by EIOPA.

Extract from the advice:

8.28 EIOPA proposes to allow prudent deterministic valuation for contracts with options and guarantees if the four following conditions are satisfied:

- i. The undertaking complies with all the low risk profile undertaking (LRU) criteria.
- ii. The time value of options and guarantees (TVOG), measured based on the prudent harmonised reduced set of scenarios (PHRSS), of the contracts where the prudent deterministic valuation is applied is below 5% of the SCR.
- iii. The undertaking adds to its Best Estimate a stochastic supplement equal to 5% of the SCR. An undertaking may calibrate an ad-hoc stochastic supplement using prudent harmonised reduced set of scenarios in case it accurately reflects its risk profile.
- iv. The stochastic supplement is kept constant through the whole SCR calculation process. Therefore, the loss-absorbing capacity of technical provisions should never be affected by the stochastic supplement.

8.29 To facilitate the assessment of these criteria, EIOPA would publish a prudent harmonised reduced set of scenarios (PHRSS) to be used to estimate the TVOG mentioned in the second criterion. This PHRSS would consist of approximately 10 economic scenarios prudently calibrated.

8.30 The process for the application of the simplification should be the same than for any other proportionality measure, including ex-ante notification and ex-post reporting.

8.31 As for any other proportionality measure, supervisors should have the possibility to challenge the use of prudent deterministic valuation and/or the calibration of the ad-hoc stochastic supplement with the prudent harmonised reduced set of scenarios even if the ex-ante notification was not challenged. Supervisors should also have the possibility to allow the use of prudent deterministic valuation in case some of the criteria are not met in the same terms than for any other proportionality measure.

#### *Information requests to develop the PHRSS framework*

The EIOPA project group on Long Term Guarantees has started a work stream to set up a methodology that can be used to produce the reduced set of scenarios. In order to fine-tune this methodology, two information requests are scheduled.

The goal of the first information request is to select a sample of undertakings that already perform a full stochastic valuation of their technical provisions (TP), and to assess the impact of a number of shortlisted PHRSS options on these entities. The comparison between the best estimate determined on basis of a full stochastic valuation and the best estimate determined on basis of the PHRSS approach will allow for improving the risk sensitivities of the scenarios and the correction technique aiming for a prudent reflection of the TVOG level.

The second information request will involve undertakings that solely assess their TP on a deterministic basis and that are in the scope of the eventual PHRSS framework. The aim of this step is to assess the feasibility of the calculations and the size of the resulting adjustments to deterministic technical provisions. Carrying out two separate information requests allows to balance complexity and completeness.

Note that the first information request will be limited to insurance obligations denominated in the Euro currency, whereas the scope of the second information request will be broadened to also include obligations denominated in other relevant currencies. The second information request will therefore also include undertakings already using a stochastic valuation in case where these undertakings carry obligations in currencies other than the Euro.

These technical specifications deal with the first information request which takes place in Q1 and Q2 2023.

### **3. Overview of the first information request**

The goal of the first information request is to assess the impact of a shortlisted number of PHRSS options compared to the full stochastic valuations used by the selected undertakings to perform their TP assessment.

The information request comprises a quantitative and qualitative questionnaire.

The qualitative questionnaire serves to accompany the quantitative part and to gain insight into the wider context of the undertaking's TP assessment (see subsection 6.7 below).

In the quantitative part of the request, the selected undertakings are requested (see further specifications in subsection 6) to provide:

- quantitative information regarding the valuation of technical provisions in accordance with solvency 2 regulatory reporting using a stochastic calculation; and
- quantitative information regarding the valuation of their technical provisions using the specified sets of PHRSS scenarios provided by EIOPA on basis of their current best estimate model.

In order to complete the information request, the undertaking should be in possession of the following files:

- The reporting template containing the qualitative and quantitative questionnaires: PHRSS\_First\_Information\_Request\_Template.xlsx
- Six Excel files with the shortlisted set of economic scenarios provided by EIOPA (see subsection 5 below)
- The note describing the methodology applied by EIOPA to derive the PHRSS scenarios.

### **4. Participation to this information request**

#### *Expectation on participation*

Participants are individual undertakings of the EEA which already perform their TP assessment with full stochastic scenarios and which have life insurance obligations (denominated in Euro) with embedded options and guarantees.

- 1- Undertakings are not expected to participate if their assets main exposures are on risk factors that are not (yet) included in the PHRSS (e.g. exposure to a currency other than euro).

#### *Benefits for the participating undertakings*

The advantages for undertakings include:

- 1- An improved level playing field via an enhanced harmonization of the supervision;
- 2- A tool for sensitivity for the undertakings (e.g. for the actuarial function report);
- 3- A practical way to determine whether there is a need or not for a stochastic valuation.

#### *Contact points*

For practical purposes, undertakings are advised to designate at least a contact person, who will liaise with their supervisor for the purpose of this data request.

### **5. Economic scenarios provided**

There are 6 set of economic scenarios provided in the following files:

- PHRSS\_1.xlsx
- PHRSS\_2.xlsx
- PHRSS\_3.xlsx
- PHRSS\_4.xlsx
- PHRSS\_5.xlsx
- PHRSS\_6.xlsx

A description of the methodology applied by EIOPA to derive these scenario sets is contained in a separate word document (PHRSS\_Methodology.docx).

An additional table PHRSS\_ES\_all.xlsx is also provided with all the scenarios concatenated in a single file (6 sets of scenarios \* 9 scenarios = 54 stochastic scenarios).

Each file (except for PHRSS\_ES\_all.xlsx) describes a set of 9 economic scenarios. For each scenario, the following economic values in the Euro currency are simulated at each time-step up to the time horizon (120 years):

- Deflator
- ZC prices for maturities 1 to 40 years
- Equities indexes (base value at t=0 being 1)
- Property indexes (base value at t=0 being 1)

Other risk factors are expected to be added in the future.

In case the undertaking uses risk factors not simulated by the PHRSS in order to calculate its Best Estimate, it should use hypotheses based on the risk-free rate return of the scenario as described below.

**Regarding bonds:** the PHRSS doesn't include the modelling of stochastic spreads and credit, the undertakings are therefore expected to value the bonds at each time-step with a calculation based on the simulated risk-free interest rates with adjustments to ensure that the market value of the bonds at the reference date is equal to the discounted sum of cash flows based on risk free rates at t=0. These adjustments could for example be:

- Discounting the bonds cash flows using the simulated risk-free interest rates plus a deterministic spread. This deterministic spread is determined at reference date so that the discounted sum of cash flows equals the market value of the bonds.
- Discounting the adjusted bonds cash flows using the simulated risk-free interest rates without spread. This adjustment of the bonds cash flows can for instance be performed using a proportional approach (i.e. adjust the nominal N with a factor  $\alpha$  so that at the reference date  $MV = \alpha N \left( \sum_{t=1, M} \frac{C}{(1+r_t)^t} + \frac{1}{(1+r_M)^M} \right)$  where  $r_t$  is the EIOPA risk free rate for maturity  $t$ , and  $C$  is the coupon rate of the bond).

**Regarding inflation:** the PHRSS includes neither the modelling of the real interest rate curve nor the modelling of the realized inflation rate. These can be determined at each time-step given the real zero coupon bond prices at reference date ( $P_r(t=0, m) = \frac{1}{(1+\text{real rate}_m)^m}$  for maturity  $m$ ) by determining the forward real zero coupon bond prices seen at reference date ( $P_r(t, M) = \frac{P_r(0, t+M)}{P_r(0, t)}$ ) and assuming that at each time-step the real zero coupon bond prices are the forward real zero coupon bond prices seen at reference date. The real rates are assumed to evolve deterministically along the forward real rates. Undertakings can then obtain the realized inflation index at each time-step for each scenario with

the following relation:  $I(t) = \frac{P_r(0,t)}{\text{Deflator}(t)} I(0)$  where  $I(0)$  is the reference date value of the inflation index. This realized inflation index is therefore stochastic and ensures the martingale properties of the scenario set. The inflation rates can then be obtained as the relative change in the index value  $I(t)$  between two time steps.

**Regarding other assets:** the “conditional certainty-equivalent” approach supposes the market value of the assets doesn’t follow its own stochastic process but their value is assumed to evolve as the bank account (i.e. the inverse of the deflator). For a specific index that would not be provided in the PHRSS, the future value of the index at time  $t$  would therefore be  $\text{Index}(t) = \text{Index}(0) / \text{Deflator}(t)$ . In this fallback approach, the assets values evolve as their expected value conditionally to the scenario, i.e. their discounted value (with the deflator of the scenario) is assumed to be constant.

**The time horizon is 120 years** and the scenarios are provided with two time-steps: **annual time-step or monthly time-step.**

The scenario set files are organized on the following pattern:

- Column A: number of the scenario
- Column B: name of the variable
- Column C: value at  $t=0$
- Column D: value at  $t=0 + \text{time-step}$  (either 1 year or 1 month)
- ...

## **6. Specification of the requested information**

### **6.1. Outline**

The submissions to the information request should be made by filling the provided excel file: PHRSS\_First\_Information\_Request\_Template.xlsx.

See below for an outline of the requested information in each tab of the file:

#### **01. Basic information**

General information on the undertaking.

#### **02. Qualitative questionnaire**

Insight in the wider context of the undertaking’s BE assessment.

#### **03. BE own calculations:**

In this section, the undertaking is expected to provide quantitative information regarding its own BE calculations: technical provisions evaluated in accordance with the Solvency 2 regulatory reporting using a stochastic calculation. The precise directions are explained in 6.4.

#### **04. BE with PHRSS:**

Valuation of the liabilities using PHRSS economic scenarios

In this section, the undertaking is expected to provide quantitative information regarding the valuation of its liabilities in each of the scenarios provided for the different sets of scenarios. The precise directions are explained in 6.5.

## **6.2. Conventions and assumptions to be used for the submissions**

#### *Reference date*

The data as at year-end 2021 (i.e. 31 December 2021) are requested from the participants, using the year-end 2021 valuation methodology.

#### *Currency*

The data are requested in the reporting currency.

#### *Sign conventions*

Companies should use the convention that outflows are denoted by positive values of the economic amounts and inflows by negative values.

#### *Number format*

The economic quantities must be indicated in the unit of the currency used. Do not use data in thousands, millions, etc...

### **6.3. Scope**

The scope of this information request comprises life obligations that include options and guarantees. Note that PHRSS scenarios are specified for the Euro currency, so the calculations should be limited to obligations denominated in Euro.

### **6.4. Directions for the « BE own calculations » tab**

Quantitative information on own Best Estimate calculations:

This tab should be filled using the stochastic economic scenario generator that was used for the Solvency 2 regulatory reporting as at year end 2021 with the same parameters.

All BE values should refer to the best estimate gross of reinsurance and without the use of transitional measures on technical provisions and, where applicable, without use of a volatility adjustment.

For each LOB as specified below, the participant is also asked to specify the BE value (also gross of reinsurance) under the certainty equivalent scenario.

In this “certainty-equivalent” scenario, the market value of the assets doesn’t follow a stochastic process but their value is assumed to evolve deterministically following the forward rates implied by the initial EIOPA risk free interest rate term structure. For instance, given the ZC bonds prices of the EIOPA risk free rate  $ZC(t = 0, m)$  for all maturities  $m$  at time  $t = 0$ , the forward zero-coupon bonds prices of the certainty equivalent scenario at time  $t$  for maturity  $m$  are calculated with  $ZC(t, m) = ZC(0, m+t) / ZC(0, m)$ . For an index-linked asset, the future value of the index at time  $t$  would be  $Index(t) = Index(0) / ZC(0, t)$ .

In other words, in the certainty equivalent scenario, the assets value is expected to evolve as their expected value (based to the EIOPA risk free rate), i.e. their discounted value is assumed to be constant.

EIOPA will determine the time value of options and guarantees (TVOG) as the difference between these two values.

This tab should be filled at the granularity of the following LoB:

- With profit business with options and guarantees

- Unit-linked or index-linked business with options and guarantees
- Health insurance business pursued on a similar basis to life insurance (SLT) with options and guarantees

Where the volume of business in one of these LOBs is less than 10% of the overall business (measured in terms of the volume of technical provisions), the undertaking may avoid calculating the PHRSS sensitivities.

The participant is also asked to specify the Solvency Capital Requirement (SCR) in this section.

### 6.5. Directions for the « BE with PHRSS » tab

Quantitative information on PHRSS valuation.

This tab should be filled at the same level of granularity as specified for the “BE own calculations” tab.

All PHRSS values should be specified on basis of the same actuarial setting (e.g. model points, technical hypothesis, assumptions on future management actions) as used in the supervisory reporting per year end 2021.

### 6.6. Directions for qualitative questionnaire

The qualitative questionnaire comprises questions regarding the scope of the risk factors that are modelled stochastically within the ESG as well as some basic information (number of scenarios used, timestep, and time horizon of the projection).

Overall comments and precisions (optional)

### Description of the risk factors modelled

Output of the ESG for the EUR device	Modelled (yes/no)	Remarks
Nominal IR		
Real rates / inflation		
Equity Index: Large cap e.g. Eurostoxx 50		
Equity index: Private Equity		
Equity index: Hedge Funds		
Equity index: Infrastructure		
Equity index: Other (precise)		
Bonds index		
Property index		
Sovereigns spreads		
Corporate spreads		

<b>FX</b>		
<b>Others (precise)</b>		

**Miscellaneous**

<b>Number of scenarios used</b>	e.g. 5000
<b>Time horizon</b>	E.g. 50
<b>Timestep</b>	e.g. annual, monthly, ...

**7. Deadline and practical aspects of filling out the data request**

*Deadline*

Participants should submit their response to the information request to the national supervisory authority until **14 April 2023**.