



# Actuarial Society of the Philippines

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## **ASP GUIDANCE NOTE (GN2016-01)**

### **Clarificatory Guidelines on Defined Benefit Pension Valuation Standards**

In accordance with Philippine Accounting Standards No. 19 (PAS19)

**Official Release**

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2016 Employee Benefits Committee



## I. Introduction

The Actuarial Society of the Philippines reaffirms its adherence to the Philippine Accounting Standards No. 19 (PAS19) for the actuarial valuation of a defined benefit (DB) retirement plan.

This Guidance Note intends to establish a common understanding among retirement practitioners of the proper, consistent and correct liability valuation methodology of benefits under a DB plan in accordance with PAS19. This shall clarify and reinforce the ASP's Standards of Actuarial Practice on the Valuation of Retirement Plans and Practice Guide on Reporting Under PAS 19.

## II. Scope of the Guidance Note

This Guidance Note seeks to discuss the following items which are relevant to the valuation of defined benefit retirement plans:

1. Benefits to be valued
2. Actuarial assumptions
3. Valuation methodology
4. Certification of actuarial valuation reports

## III. Benefits to be Valued

All benefits under a defined benefit plan, not otherwise classified as short-term or termination benefits as defined in paragraph 8 of PAS19<sup>1</sup>, shall be considered in the actuarial valuation. Such benefits include, but are not limited to, early retirement benefits, vested resignation benefits, death benefits and disability benefits which are subject to age and/or service requirements and increase with tenure<sup>2</sup>.

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<sup>1</sup>PAS 19, par 8 :*Short-term employee benefits* are employee benefits (other than termination benefits) that are expected to be settled wholly before twelvemonths after the end of the annual reporting period in which the employees render the related service.

*Post-employment benefits* are employee benefits (other than termination benefits and short-term employee benefits) that are payable after the completion of employment.

*Other long-term employee benefits* are all employee benefits other than short-term employee benefits, post-employment benefits and termination benefits.

*Termination benefits* are employee benefits provided in exchange for the termination of an employee's employment as a result of either:

- (a) an entity's decision to terminate an employee's employment before the normal retirement date; or
- (b) an employee's decision to accept an offer of benefits in exchange for the termination of employment.

<sup>2</sup>Vested separation benefits, death and disability benefits are neither termination, nor short-term benefits and hence should be considered as post-employment benefits and should be valued accordingly.



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In particular, whenever a defined benefit retirement plan provides for vested separation benefits to resigning employees/members, and/or death and disability benefits, these benefits must be calculated in accordance with the valuation methodology provided in the standards and the resulting liabilities are included as components of the Defined Benefit Obligation (DBO). An example on how vested benefits of resigning employees are included in the DBO calculation is illustrated in Annex A.

## IV. Actuarial Assumptions

As provided under paragraph 55 of PAS 19, actuarial assumptions are required to measure the obligation and expense under defined benefit plans. These assumptions comprise of demographic assumptions such as mortality, rates of employee turnover, disability, and early retirement and financial assumptions dealing with the discount rate and future salary (paragraph 76).

This Guidance Note emphasizes that actuarial assumptions should reflect the best estimate of the future demographic characteristics of the group and market expectations. These assumptions should be unbiased and mutually compatible (paragraph 77). Conservatism should not be a justification to exclude any of the aforementioned assumptions or to assume other than the fair estimate of the variables. Specifically, the absence of turnover, death or disability decrements assumption in the valuation are not acceptable even if these result to a higher liability unless the actuary can reasonably justify that these are his best estimates of the group's demographic outlook.

## V. Valuation Methodology

PAS19 specifically requires the use of the Projected Unit Credit(PUC) cost method in the valuation of defined benefit plans(paragraph 67).

The Actuarial Equivalence Principle as it applies to the valuation method should be observed. That is, upon entry of a member, the present value of future Current Service Costs should be equivalent to the present value of future benefits and at any time, the Present Value of Defined Benefit Obligation should be equivalent to the present value of future benefits less the present value of future Current Service Costs. Relatedly, if assumptions are kept unchanged and experience follows exactly the assumptions, no actuarial gains or losses on the obligation should occur.



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In calculating the defined benefit obligation and the current service cost, the formulas shown in the Annex A satisfy the requirements of PAS19 for benefits prorated over the period of service of a plan member.

## **VI. Certification of Reports**

The actuarial valuation report under Pas 19 should be signed by a Fellow of the Actuarial Society of the Philippines in good standing.

## **VII. Implementation of Guidelines**

All members of the Actuarial Society of the Philippines, particularly all Fellows certifying the basis, calculations and amounts of defined benefit obligations, should comply with the standards under PAS19 and all relevant guidelines issued by the ASP, including this Guidance Note (GN2016-01).



## ANNEX A

These formulas generally satisfy the requirements of PAS19 for benefits prorated over the period of service of a plan member.

$$PVDBO_{x+t} = \sum_{k=0}^{w-x-t-1} v^{k+1} {}_k p_{x+t}^{(T)} \frac{t}{t+k+1} \left[ B_{x+t+k+1}^{(s)} q_{x+t+k}^{(s)} + B_{x+t+k+1}^{(d)} q_{x+t+k}^{(d)} + B_{x+t+k+1}^{(dis)} q_{x+t+k}^{(dis)} + B_{x+t+k+1}^{(r)} q_{x+t+k}^{(r)} + \dots \right]$$

$$CSC_{x+t} = \sum_{k=0}^{w-x-t-1} v^k {}_k p_{x+t}^{(T)} \frac{1}{t+k+1} \left[ B_{x+t+k+1}^{(s)} q_{x+t+k}^{(s)} + B_{x+t+k+1}^{(d)} q_{x+t+k}^{(d)} + B_{x+t+k+1}^{(dis)} q_{x+t+k}^{(dis)} + B_{x+t+k+1}^{(r)} q_{x+t+k}^{(r)} + \dots \right]$$

where:

- DBO = Present Value of Defined Benefit Obligation
- CSC = Current Service Cost calculated at the beginning of the period
- x = entry age / hire age
- t = years of service
- w = mandatory retirement age where separation rate should be set to 100%
- B = benefit payable given t and attained age x + t
- $q^{(s)}, q^{(d)}, q^{(dis)}, q^{(r)} \dots$  = decrements; rates of separation, death, disability, retirement
- $B^{(s)}, B^{(d)}, B^{(dis)}, B^{(r)} \dots$  = applicable benefit payable

$B^{(s)}$  - should reflect the vested benefit payable upon separation of a member if the retirement plan provides for vested benefits; should not be assumed to be zero

$B^{(d)}$  - should reflect the death benefit payable upon death of a member if the retirement plan provides for death benefit

$B^{(dis)}$  - should reflect the disability benefit payable upon disability of a member if the retirement plan provides for disability benefit

Note that the above formulas have the following assumptions:

1.  $p^{(T)} = 1 - q^{(s)} - q^{(d)} - q^{(dis)} - q^{(r)} - \dots$

Alternatively,  $p^{(T)}$  may also be equal to  $(1 - q^{(s)})(1 - q^{(d)})(1 - q^{(dis)})(1 - q^{(r)}) \dots$ , which requires an adjustment to the above formula. The appropriate survival formula should depend on whether the decrements used are independent of each other or not.



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2. Decrements occur at the end of the year  
The above formula can be modified to consider decrements that occur during the beginning or the middle of the year.
3. Entry date falls on the employee's birthday  
Adjustments should be made to consider the exact entry age of the employee.
4. Attribution factors  
Adjustments should be made if a particular benefit needs to be attributed on a non-linear fashion based on the plan's formula or attributed only to a specific period of service.
5. Benefits terminate at a mandatory retirement age  
The above formula should be modified if mandatory retirement is based on years of service or other conditions.
6. Current Service Costs are calculated at the beginning of the period  
The above formula may be modified depending on the timing of calculation and the relevant period covered by the Current Service Cost.

Below is a numerical example that illustrates the PUC cost method and its application assuming prorating of benefits to periods of service. The illustration has been simplified to highlight the prorating method and inclusion of pre-retirement benefits in the calculations.

**Given:**

- Benefit: 100 per year of service subject to the following percentage schedule:

YOS	Separation	Death	Disability
1	0%	100%	100%
2	50%	100%	100%
3	100%	100%	100%

- Decrements: yearend occurrence,  $p^{(T)} = 1 - q^{(s)} - q^{(d)} - q^{(dis)}$

t	$q^{(s)}$	$q^{(d)}$	$q^{(dis)}$
1	0.190	0.006	0.004
2	0.480	0.010	0.010
3	1.000	-	-

- Discount rate = 2.0% p.a.



## Results: Calculations:

The benefits are allocated as follows:

t	B <sup>(s)</sup>	B <sup>(d)</sup>	B <sup>(dis)</sup>	B <sup>(s)</sup> / t	B <sup>(d)</sup> / t	B <sup>(dis)</sup> / t
1	0	100	100	0	100	100
2	100	200	200	50	100	100
3	300	300	300	100	100	100

The resulting PVDBO and CSC every year are shown in the following table.

t	CSC	PVDBO <sub>end</sub>
1	59.84	73.55
2	75.02	196.08
3	100.00	-

The Current Service Costs are calculated as follows:

$$\begin{aligned}
 CSC_0 &= (1.02)^0(1.000)[(0)(0.190) + (100)(0.006) + (100)(0.004)] + \\
 &\quad (1.02)^{-1}(0.800)[(50)(0.480) + (100)(0.010) + (100)(0.010)] + \\
 &\quad (1.02)^{-2}(0.400)[(100)(1.000)] \\
 &= 59.84 \\
 CSC_1 &= (1.02)^0(1.000)[(50)(0.480) + (100)(0.010) + (100)(0.010)] + \\
 &\quad (1.02)^{-1}(0.500)[(100)(1.000)] \\
 &= 75.02 \\
 CSC_2 &= (1.02)^0(1.000)[(100)(1.000)] \\
 &= 100.00
 \end{aligned}$$

The Present Value of Define Benefit Obligations arecalculated as follows:

$$\begin{aligned}
 PVDBO_0 &= 0.00 \\
 PVDBO_1 &= (1.02)^{-1}(1.000)[(50)(0.480) + (100)(0.010) + (100)(0.010)] + \\
 &\quad (1.02)^{-2}(0.500)[(100)(1.000)] \\
 &= 73.55 \\
 PVDBO_2 &= (1.02)^{-1}(2)(1.000)[(100)(1.000)] \\
 &= 196.08 \\
 PVDBO_3 &= 0.00
 \end{aligned}$$

## Actuarial Equivalence Principle Check:

To check the consistency of the calculated CSCs and PVDBOs, let us assume 1,000 employees were hired on the same date.



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The movement in the employee force would be as follows:

t	l	s	d	dis
1	1,000	190.0	6.0	4.0
2	800	384.0	8.0	8.0
3	400	400.0	-	-

The movement in the PVDBO would be:

t	PVDBO <sub>beg</sub>	CSC	Int Cost	Ben	Gain/Loss	PVDBO <sub>end</sub>
1	-	59,839	-	(1,000)	-	58,839
2	58,839	60,016	1,177	(41,600)	-	78,431
3	78,431	40,000	1,569	(120,000)	-	-

$$PVDBO_1 = 73.55 \times 800 = 58,839 \text{ and } PVDBO_2 = 196.08 \times 400 = 78,413$$

Notice that no actuarial gains or losses occur. If the CSCs and PVDBOs were calculated differently, gains and losses would occur.

Upon entry of the 1,000 employees:

$$\begin{aligned} PV \text{ of CSCs} &= (59,839)(1.02)^{-1} + (60,016)(1.02)^{-2} + (40,000)(1.02)^{-3} \\ &= 154,044 \end{aligned}$$

$$\begin{aligned} PV \text{ of Benefits} &= (1,000)(1.02)^{-1} + (41,600)(1.02)^{-2} + (120,000)(1.02)^{-3} \\ &= 154,044 \end{aligned}$$