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# the Actuary INDIA

INDIAN ACTUARIAL PROFESSION
Serving the Cause of Public Interest

THE MAGAZINE OF THE INSTITUTE OF ACTUARIES OF INDIA

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Chief Editor
Sunil Sharma
Email: sunil.sharma@kotak.com

Editors
Kollimarla Subrahmanyam
Email: ksmanyam52@ymail.com
Dinesh Khansili
Email: dinesh.khansili@mithrasconsultants.com

Puzzle Editor
Shilpa Mainekar
Email: shilpa_vm@hotmail.com

Librarian
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Email: library@actuariesindia.org

COUNTRY REPORTERS

Krishen Sukdev
South Africa
Email: Krishen.Sukdev@iac.co.za

Frank Munro
Srilanka
Email: Frank.Munro@avivandb.com

Anshuman Anand
Indonesia
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Vijay Balgobin
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Kedar Mulgund
Canada
Email: kedar.mulgund@sunlife.com

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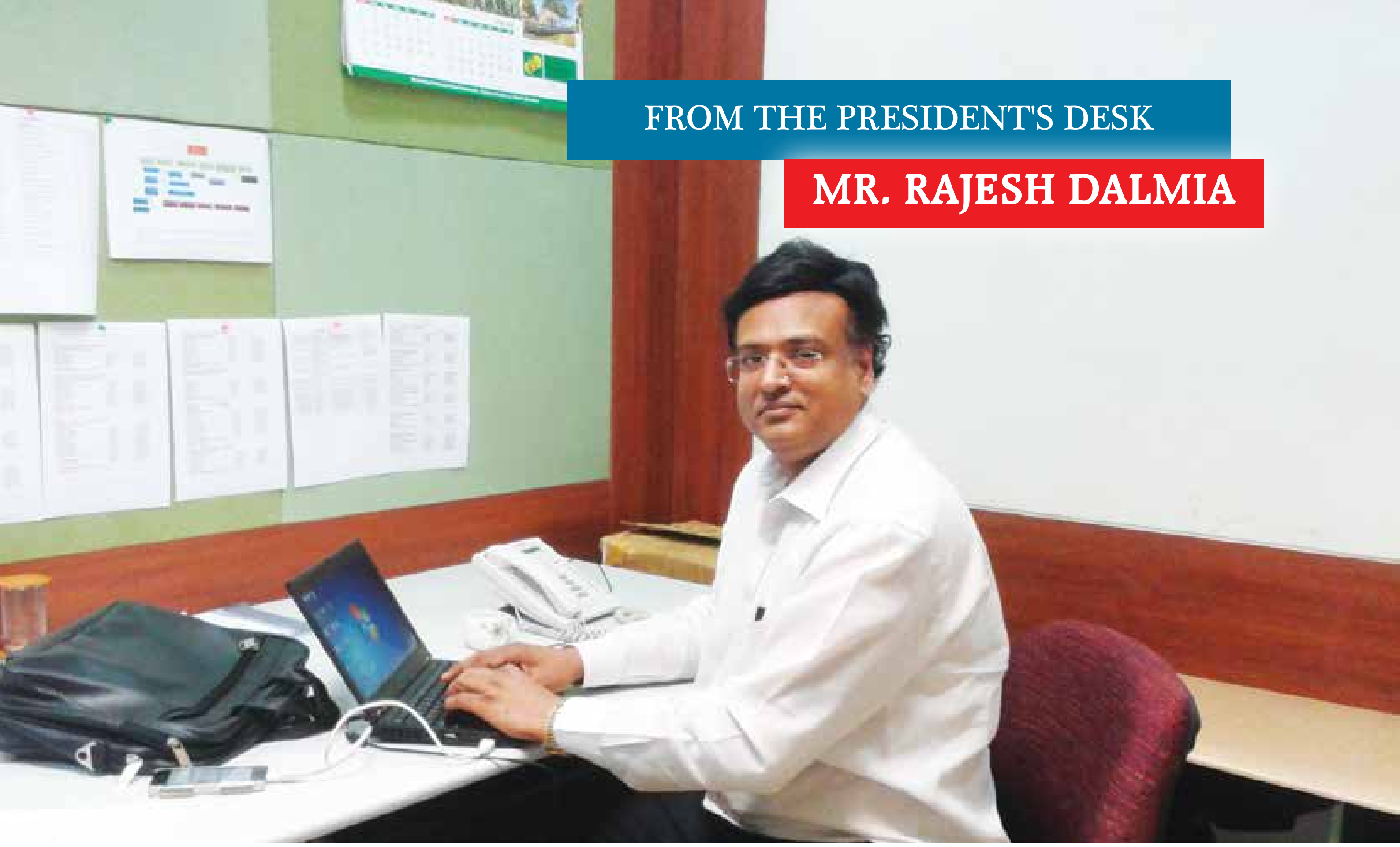


# FROM THE PRESIDENT'S DESK

## MR. RAJESH DALMIA

Dear Members

Thanks for all the feedback given by you all for the improvements within the Institute. I keep hearing that "the Institute is not carrying out much work in the interests of its members. It's been more than fifteen years and yet we do not have our own study material. Neither does our examination system is consistent over the years etc." However, the profession is critically dependent on its own members to deliver on many of the above objectives and beyond. We do not have too many members unlike larger bodies like IFoA/SoA. In such a situation it is imperative that all members contribute to the profession. Rather than repeatedly blaming others, it is important that members start taking actions to change things.

Recently we launched expression of interest for development of study material on various Specialist Application papers. It is interesting to note that we have not yet received any submission till date on this though we are happy to enter into a commercial proposition. Unless our members take active interest on these issues and decides to be an agent of change, another century would pass without any study material. I do urge you to take on responsibility on your shoulders to be agent of change rather than just cribbing.

We started a small experiment by conducting the coaching class on subject CT4. CT4 was chosen as it has the lowest pass rate. The essential idea is to take all the learnings from this class before we decide to launch coaching across large number of papers.

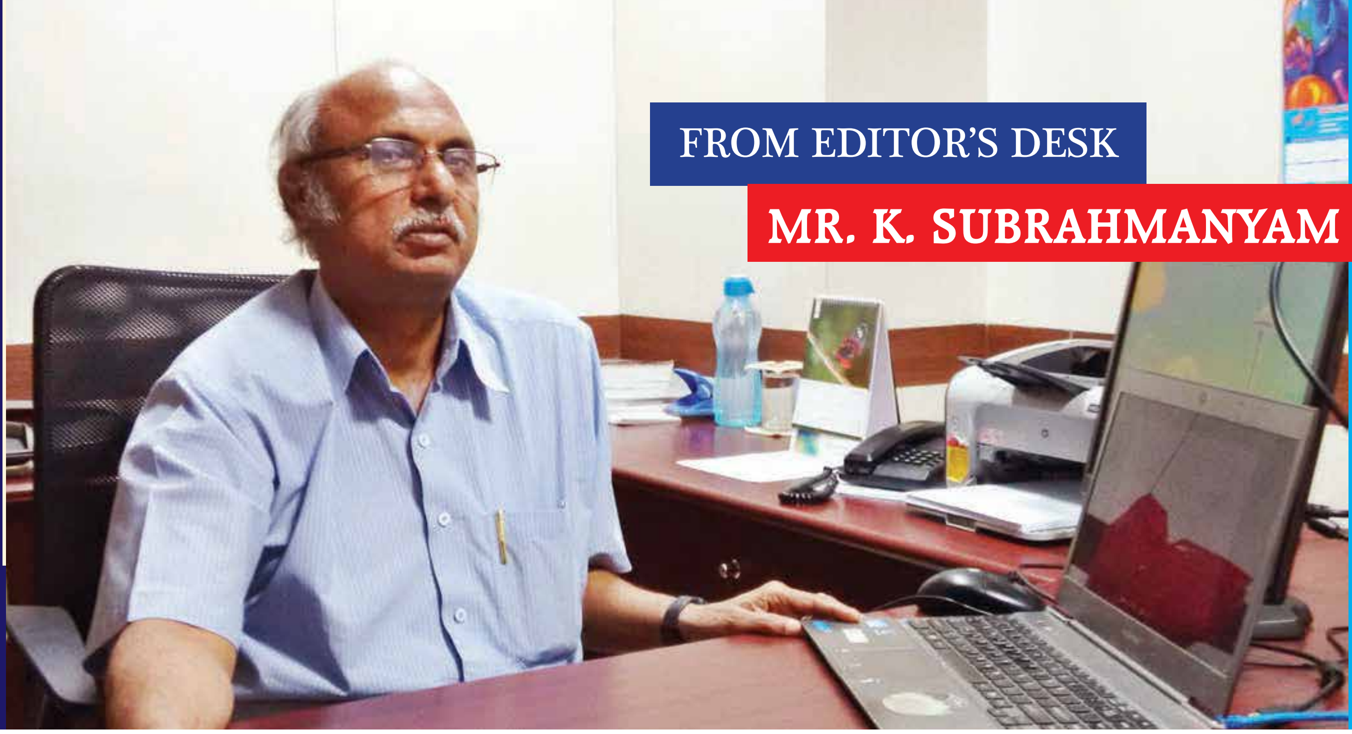
I would like to thank you for providing valuable feedback on draft CPD regulations. It would be quite useful if we actuaries ensure that we provide our opinion on various public drafts issued by various bodies like IRDAI, Ministry of Finance etc. I believe it is a good practice to take a feedback on any legislation/regulations issued by any organization. The process of feedback is likely to eliminate any obvious or glaring errors and also provides various other perspectives to the same. However, once the regulation is passed and it is a law then it is no more a subject for public comments but for implementation of the same. One should just go about executing the tasks given in the regulations.

The next two years can be quite interesting for the insurance industry in India. A lot of the restrictions in the old Insurance Act, 1938 were dropped and left to the regulator to draft new regulations around the same. However, whether regulator exercises its power to modify the existing practice under the Act is not yet known. It is possible that the regulator may not change much at this instance but then reissue the regulations after a few months. We have already seen the draft version on alternative form of capital. Similarly, there are many others which would be launched in a span of a few months. I would urge our members to critically provide the relevant feedback to IRDAI as and when these get released.

Yesterday I was reading an article regarding the technological advancements and how it can affect our lives. The technology has advanced so much that even parliament decisions can now be participated by a large bastion of citizen. However, the costs are still quite high. Given these kinds of technological advancements does the democracy process need to have a relook so that rather than selecting representatives, citizen themselves pitch in and decide by votes? These types of advances are leading to rapid break down of the world as we know it today. We need to prepare ourselves for the new world of tomorrow which is going to be completely different.

# FROM EDITOR'S DESK

## MR. K. SUBRAHMANYAM

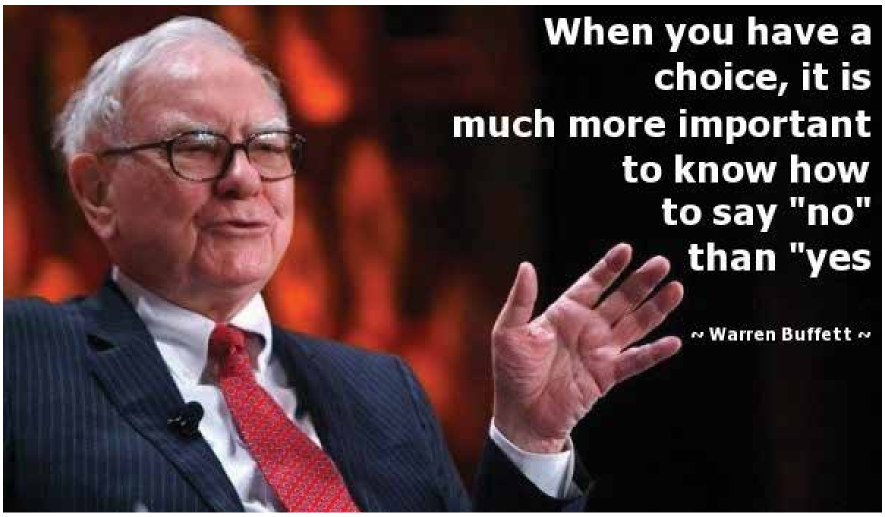


Candidates feel happy when they pass, but get disappointed when they fail to pass exams. I came to know that there are nearly 20+ candidates one subject short of becoming fellows. I interacted with a few of them. They were of the opinion that they had been failed when they wrote very well. Some were interested to know thro' RTI Act about their performance [similar to the one in CA exams]. Though they could find out through RTI for their satisfaction, I should say examiners intentionally would not fail the candidates. In this regard, I would appreciate the efforts taken by some of our actuarial colleagues, who did counseling. There are some actuaries who are keen for Actuarial Education Company [on the lines similar to the UK Institute of Actuaries] to help the candidates to pass the exams and be useful to the actuarial profession. In this regard, I would like to quote the statement made by Mr. KPS Gill, former DGP of Punjab, which is quite relevant to all those who could not achieve something [Students who fail frequently, Bodies which fail to correct undisciplined members, students, etc.]: *'You don't prepare for terrorism after it has happened. And you don't just learn from your own experience'.* Very few have any intention or thought of getting caught or punished when they do not do in the way things should be done. Even Mr. N Srinivasan, former chairman of BCCI could not get spared by the Hon'ble Court!

Students should not get disappointed. The difference between a candidate who passed the exam and another who did not pass is very thin. The difference was mostly due to improper planning to answer the question. Exams are not traps to fail the candidates. Advice to students who fail frequently: Question what went wrong. Most candidates fail because they do not read the question to understand what the examiner wants. Candidates might be writing something else. This is the golden rule—*Read and understand the question thoroughly.* For every question, the answer will be in 4 or 5 points [or more]. Jot down those points in a rough paper [points could be a single word or phrase]. For instance, there is a question—discuss how an appointed actuary would determine surrender values for endowment contracts---points should be:

1. Statutory surrender values; 2. Special surrender values; 3. Surrender charges; 4. Competition; 5. Surrender profit; 6. surrender and reentry. Plan these and elaborate the points in your answer. Golden Rules [repeated]: 1 Read the question thoroughly; 2. Jot down points; 3. Plan [in your mind for answer in a clear language]. 4. Check again whether you answered the question right.

Maintenance of standards of the actuarial profession is important for the actuarial profession. There are APS, GNS, Professional courses and Seminars for members to learn and update themselves. A member is expected to follow professional ethics, integrity, competence or professional judgment, which other Members or the public might reasonably expect.



Organized By : Institute of Actuary of India
Venue : The Club, Mumbai
Date : 7th August, 2015
Faculty : Prof. Satish Kakri

# 6TH LEADERSHIP DEVELOPMENT PROGRAM ON PUBLIC SPEAKING

## Seminar Highlights

An Actuarial professional needs to ensure that he has sufficient impact on the mind of his client at the time of conversation along with the professional services he is going to provide to the client. The program was held with the motive to provide understanding on the importance of public speaking by a professional. The style in which the seminar was held and the motive of the program blended beautifully to provide the end results needed from the program.

**Prof. Satish Kakri** conducted the training on behalf of the Institute of Actuary of India. He is M.A. in English with diploma in Advertisement and Mass Communication. Mr. Kakri has been actively offering corporate training in the areas of communication, leadership skills and team building, etc.

The seminar started with basic details relating to the organs which create sound. Having provided the details, he ensured that those organs are being put to use the whole time throughout the seminar. He provided materials to practise and also taught the way the same should be done. **Prof. Satish Kakri** also gave the fine line of difference between raising voice and tuning the public speaking done. He later gave topics to think on and speak on the same for 5 minutes which really rested his case that the public speaking is very important and with persistent efforts (like followed during seminar) can make it really effective.

He opted for Shakespeare plays as the same are difficult to read and hence ensuring that fluency in English speaking is obtained. Obviously, the same needs continuous practise and hence various reference materials that can be used to develop such kind of readings were provided by him. Practical application was the main theme of the seminar and it was clearly depicted since every participant was asked to come to the podium and exercise public speaking.

The second half of the seminar started with certain videos of speeches of great leaders like Martin Luther King, Barack Obama, Swami Vivekanand, Adolf Hitler, etc. For every speech, he concentrated on the pause, clarity and style applied by the leaders rather than just the wordings used by them. This greatly emphasised the understanding of public speaking and its impact on the audience. The emotions were reaching the audience because of the basic public speaking skills used by the speaker. The same was then followed by the application of use of skill set learnt to the practical life like in inauguration function, felicitation functions, etc. and giving every participant their respective roles.

Later, various topics were given to the group of participants for debate and group discussion. He also explained what debate and group discussion actually means and pinpointed the areas where we use debate and group discussion interchangeably. It was really useful.

The best part of the whole seminar was the very fact that Prof. Satish Kakri revolved the whole coaching around the current affairs of the country, for eg, in one scenario he put the most important topic – 'Social median a boon' for debate. He indirectly tried to make participants think about current affairs making the seminar lively.

## Summary of Seminar

In practical life, it is very important to be expressive about what you feel. The seminar initiated the very fact by asking every participant to talk about himself for few minutes. **Prof. Satish Kakri** highlighted the improvement areas for every person and also appreciated the participants to keep the motivation up. It was a very effective seminar for beginners of public speakers. All in all it started with introduction, continued with practise and ended with key to successful communication for everyone.


ABOUT THE AUTHOR

**Mr. Pratik Thakkar**

is a working professional from Ernst and Young. He is a Qualified Chartered Accountant and has entered the Actuarial world recently.

pratik.thakkar53@yahoo.com

# PARTICIPANT'S FEEDBACK

It was really good to be here. I never had knowledge of how voice modulation can be done and how it can work to our advantage. Learnt how to speak confidently without messing up words in between and to speak with clarity.

I would like to get further trainings on the concepts taught. Moveover I would like to improve my overall English Skills, be it writing or speaking. I studied in non-english medium school till class 12. So I feel my english needs improvement. Any further trainings be it online or offline will help.

The session was excellent. The trainer offered a lot of insights and was both encouraging and forgiving. I hope the Institute continues to arrange similar programs in the future as well.

Overall the seminar is very interactive. The presentation of content is very clear and relevant. Techniques taught are practicable and can be implemted in day-to-day work. Overall this seminar was very helpful for me and I recommend it to my colleagues to take part in these seminars.

It was an excellent training program with focus on true improvement in public speaking & communication skills. Wonderful experience!

It was nice participating among a very enthusiastic team members and the best Guru on Communication. Certain things for more improvement - More time should be given say instead of one day it should be for one week. More participation personally with certain areas of improvement, basically for removing stage fear, controling breath, changing the voice etc.

# 11TH SEMINAR ON CURRENT ISSUES IN RETIREMENT BENEFITS

| | | |
|---|---|---|
| Organized by | : | Advisory Group on Pension, Other Employee Benefits and Social Security, IAI |
| Date | : | 21st August, 2015 |
| Venue | : | Hotel Sea Princess, Mumbai |

### Introduction- Kick Off Presentation by Advisory Group on Pension, Employee Benefits and Social Security (PEBSS)

**Speaker: Ms. Chitra Jaisimha, Secretary, Advisory Group on PEBSS**

In her welcome address, **Ms. Chitra** shared two interesting journeys.

a. Indian Accounting Standards (Ind AS) equivalent to IFRS

b. National Pension System

Journey of formulation of the new Indian Accounting Standards (Ind AS) emerged from the Concept Paper on Convergence with IFRS, thereafter issuance of 35 Indian Accounting Standards (Ind AS) by Ministry of Corporate Affairs and then notification of the rules for implementation of these standards by the Government. These accounting standards will be first effective from 1st April 2016. She highlighted that the notification of these IFRS converged accounting standards would fill up the significant gaps that exist in the current accounting standards. This will in turn improve India's place in global rankings on corporate governance and transparency in financial reporting.

Thereafter she shared the long journey of National Pension System from year 2004 till date. In particular, she described introduction of NPS in year 2004 as a Defined Contribution (DC) plan available to the Central Government employees, thereafter adoption of this scheme by the State Government for their employees., after that establishment of independent regulatory body-PFRDA, extension of NPS to all citizens of the country on voluntary basis effective from 1st May 2009, introduction of NPS to companies under corporate model in Dec-2011 , tax breaks for contribution into NPS from Apr-12 and passage of PFRDA bill in year 2013.

She highlighted that during the last two years, the number of subscribers and corporates registered under NPS has grown three folded.

In her last part of the presentation, she appraised the audience about the day's agenda with the hope that audience would actively participate during the entire day event.

### Session 1: Inaugural address

**Speaker: Mr. A D Gupta, Chairperson, Advisory Group on PEBSS**

**Mr. A. D. Gupta** informed the audience that the capacity building workshop on employee benefit was organised in March 2015. He had mentioned that Ind AS would be implemented in phased manner as per the notifications issued by Ministry of Corporate Affairs.

He emphasised that when the actuary will value the defined benefit liability under new Ind As regime for the first time, then the value of liability corresponding to previous year should also be provided to the companies based on new Ind As.

Mr. A D Gupta

He highlighted the following challenges with regard to implementation of IndAS 19:

1. Showing the Bifurcation of Actuarial Gains and Losses into a. Experience b. Demographic assumptions c. Financial
2. Building sensitivity analysis: Increase or decrease in actuarial assumptions.
3. Treatment of Actuarial Gains and Losses through Other Comprehensive Income (OCI)
4. Financial cash-flow of the liabilities for the next ten years should be provided
5. Implementation of methodology for computing upper limit of gratuity as per the Ind AS 19.
6. Valuation task will be challenging as there are very few actuaries available to value lacs of companies having defined benefit plans.

He also cautioned that too high or too low values of liability results may be challenged.

He had briefly touched upon the preparation and revision of Guidance Notes (GNs) keeping in mind the latest developments of Ind AS. He also posed a question whether the applicable GNs should be principle based or rule based.

### Session 2: Indian Accounting Standard (IND AS) 19, Employee Benefits

**Speaker : Dr. Avinash Chander, Technical Director, ICAI**

This session was very interesting as audience got opportunity to understand the accounting perspective of employee benefit liabilities from the accounting profession.


Dr. Avinash Chander

**Dr. Avinash Chander** started his presentation through briefing the audience about the issues faced in the accounting of employee benefits under accrual basis. In particular he talked about the issues pertaining to timing and method of recognition of employee benefits. The complexity of the issue widens when the gap between timing of recognition and settlement of obligation increases. Daunted by complexity of estimation, these issues were partly addressed through cash accounting system. Government accounting for these benefits were on a cash basis. He informed that CAG had laid down the roadmap for both Central and State Governments to migrate from cash basis accounting to accrual basis accounting. He also informed that Accounting Standards being framed for the Educational and other institutions not covered by Ind As which would also be implemented in future.

He then elaborated that how these issues were addressed by ICAI for private enterprises. In particular, he informed that statement on treatment of gratuity was withdrawn in the year 1995 when the AS 15 was effective first time. Subsequently revised AS 15 came in to effect from 7th December 2006.

IND AS 19 was issued as part of convergence programme (convergence to IFRS) that was based on International Accounting Standard 19 (IAS 19).

He further elaborated that under Ind As19 employees benefits are classified as Short Term, Post employment and other long term benefits.

Further, he mentioned that accounting for defined contribution plan is easier without any actuarial assumptions whereas accounting for defined benefit plan involves actuarial assumptions to value the liabilities.

He then broadly highlighted the differences between the current Accounting Standard 15 (AS 15) and Ind As19 with examples.

**Session 3: IND AS 19 Technical Aspects**

**Speaker: Ms. Preeti Chandrashekhar, Practice Lead-South India, Towers Watson**

**Ms. Preeti** gave an overview and key differences between AS 15 and Ind As19. She shared the timeline to adopt the Ind As19 by the companies. She highlighted that the core principles of employee benefit


Ms. Preeti Chandrashekhar

accounting remain the same for both AS 15 and Ind AS 19.

As far as discount rate assumption is concerned, she pointed out that the benefit obligation should be discounted using government bond yields which is similar to AS 15. However, additionally it is mentioned in Ind As19 that high quality corporate bonds (if bond market is deep) can be used if branches or subsidies are domiciled outside India.

She also elaborated the changes in Ind As19 compared to AS 15. In particular, in Ind As19 the immediate recognition of Actuarial Gains and Losses must be through Other Comprehensive Income (OCI) as against recognition in Profit and Loss account as per AS 15. Similarly computation of Net Interest under Ind As19 as against the computation of interest cost and the expected return of plan assets as per AS 15. She also mentioned that under Ind As19, additional disclosures should be provided to understand the risk exposures and the concentration of the risks in the plan.

She gave a graphical representation of components which are part of Profit and Loss account and the components which are included in the Other Comprehensive Income (OCI) under both current accounting standard AS 15 and the new accounting standards Ind As19. Some of the information which was not mandatory under As 15 should be provided under Ind As 19 such as split of Actuarial Gains and Losses into demographic and financial assumptions, sensitivity analysis showing effect on value of liability due to change in the actuarial assumptions, asset liability matching strategy, information about future cashflows such as funding arrangements, funding policy and maturity profile of benefit payments and DBO. She also highlighted that Ind As19 clarifies the definition and treatment of special events such as Curtailments and Settlements.

**Session 4: IND AS 19 - Impacts and Examples**

**Speaker: Mr. Khushwant Pahwa, Founder and Consulting Actuary, KPAC (Actuaries and Consultants)**

Mr. Khushwant Pahwa

Taking a leaf out of the previous session on technical aspects of Ind As19, **Mr. Khushwant Pahwa** shared some real life examples of modelling the Gratuity ceiling. He was surprised to share that to value a gratuity liability with a cap, different models were used in the industry and showed with the help of numerical illustrations that the values of gratuity liabilities produced using different models were different and emphasised that correct modelling approach should be used.

With the help of numerical illustration, he evaluated the impact of change in the actuarial assumptions on the values of the liabilities computed under different modelling approaches.

On reconciliation part, he shared with the help of illustration, comparison of reconciliation of liabilities and reconciliation of assets under As 15 and Ind As19. He also shared the recognition of expenses under both As 15 and Ind As19.

He also shared the sensitivity of liability results by varying key actuarial assumptions. Expected contribution during the next annual reporting period, maturity profile of the defined benefit obligation using weighted average duration were also shown. He emphasised the inclusion of plan characteristics with description of risks in the valuation report as per Ind As19.

He also briefly touched upon implementation time line for Ind As19 along with the challenges of transition from As 15 to Ind As19.

**Session 5: IND AS 102 –Share-based Payments**

**Speaker: Mr. Mayur Ankolekar, Consulting Actuary, Ankolekar & Co.**

Mr. Mayur Ankolekar

**Mr. Mayur Ankolekar** started his discussion stating that any accounting standard has three basic pillars namely, Measurement, Recognition and Disclosure. From service delivery perspective, all these three pillars should be delivered at one go.

Then he gave brief overview of Ind As 102-Share based payment in terms of scope (applicable to all share based transactions), types of share based payments ( equity settled, cash settled or in between equity and cash settled), recognition of cost over vesting period, measurement date of the share option given to employees, measurement based on fair value basis.

He further elaborated that the scope of Ind As102 covers 1. Share options, 2. Share based payments with cash alternatives 3.Share appreciation rights and 4. Restricted shares. Valuation techniques were discussed in detail for each of the above options. He further discussed the methodology to value share option using Binomial model and the Black Scholes Option pricing model along with setting of underlying assumptions. He briefly compared both the models.

He further elaborated the meaning of Grant Date of the option with graphical example. He then elaborated the market vesting conditions and non-market vesting conditions. He briefly touched upon the measurement of equity settled Share Based Payment Transaction (SBPT) to employees and parties other than employees. He also discussed in details the recognition principles applicable to equity settled and cash settled share options.

He informed that for cash settled SBPT, fair value is re-measured at each reporting date whereas that is not the case with equity settled SBPT unless modification before vesting date increases the fair value. During the vesting period, fair value can increase for Equity settled SBPT, if the strike price is reduced or the original vesting period is reduced. He further discussed the equity settled SBPT of group entities along with making an accounting entries.

Mr. Mayur concluded his presentation by showing the Approach Checklist and Disclosure statements about the valuation of share based payments.

**Session 6: Retirement Adequacy Overview and impact of NPS**

**Speaker: Ms. Anuradha Sriram, Director- Benefits, Towers Watson**

Ms. Anuradha Sriram

**Ms. Anuradha Sriram** started her presentation by sharing the Tower Watson savings attitude survey (India and China) 2013 wherein the average annual savings as percentage of income in India is around 24% and in China it is around 35%. As per that survey more than 25% of respondents investing in property and do not perceive the housing crash as a major risk to adequacy of retirement funding. Many respondents of the survey invested money in bank deposits and insurance products where returns were comparatively lower and not keeping up with inflation.

She also showed the statistics pertaining to Net replacement Ratios of developed and developing countries. She shared another statistics wherein the percentage of investment in physical assets in India was higher than investment in financial assets.

She also shared the county wise pension assets under formal pension system which was represented as percentage of GDP. Unfortunately for India it is just 12% of GDP.

Hence she summarised that in India low social security benefits, increase in life expectancy and increase and persistent inflation caused the inadequacy of the retirement provisions to the individual.

To address these issues, she advocated that the National Pension Scheme (NPS) would play a very important role in the retirement space. Then she briefly touched upon the journey of NPS in India. She also elaborated the structure of NPS along with operation of the scheme and roles and responsibilities of all important stakeholders namely the regulator, trustee bank, central record keeping agency, NPS trust, Point of Presence, Pension Fund Managers, Custodians and Annuity Service Providers.

Then she discussed the NPS from the individual's point of view in terms of available allocation choice of funds (namely: Active choice and Auto Choice),, tax benefits, level of commutation of corpus before and after age 60, deferment of proceeds, partial withdrawals, available annuity options and the charging structure of the scheme.

She concluded her discussion by stating that additional tax incentives, implementation of fungibility between EPF and NPS, introduction of guaranteed return product, robust investment governance and performance record together with greater awareness would propel the growth of NPS in future.

**Session 7: Technical Updates - India and Global**

**Speaker: Mr. Kulin Patel Director, Client Account Management, Towers Watson**

**Mr. Kulin Patel** started with the background that International Financial Reporting Interpretations Committee (IFRIC 14) provided clarification on the application of asset ceiling under IAS 19 that led to varied views between audit firms. International Accounting Standard Board (IASB) has recently published exposure drafts covering re-measurements following 'Special Events' such as

Mr. Kulin Patel

amendment, curtailment or settlement of the plan. Potential impact and implications of these changes were well covered by him.

He briefly introduced the asset ceiling under IAS 19. He further added that IFRIC14 issued in 2007 provided clarification on the interpretation of the interaction between the asset ceiling and minimum funding requirements; effective for IFRS reporting entities starting 31 December 2008. However, request was sent to IFRS Interpretation Committee for amending IFRIC 14, with more clarifications on the same.

In the concluding part, **Mr. Kulin Patel** briefly touched upon the current status and developments of US GAAP accounting convergence to IFRS. In particular, challenges and issues of convergence to IFRS were highlighted by him.

### Vote of Thanks

**Speaker: Ms. Chitra Jaisimha, Secretary, Advisory Group on PEBSS**

The event which was replete with interesting debate and insightful discussion finally came to a close with a vote of thanks by **Ms. Chitra Jaisimha.** She briefly summarised discussions by various speakers. She thanked the Institute for organising such an informative and interesting seminar and the participants for their valuable time and inputs.


ABOUT THE AUTHOR

**Mr. Suresh Sindhi**

is a Fellow member of Institute of Actuaries UK and Institute of Actuaries of India with more than 15 years actuarial experience. Currently, he heads the pricing at Star Union Dai-ichi Life Insurance Company Limited

sindhisn@rediffmail.com


## PARTICIPANT'S FEEDBACK

I think it was fairly balanced & had a good coverage of topics

Relevant topics were included. It would be better if more time is available & the seminar continues for 2 days if possible with more practical examples & technical outputs.

Really liked the seminar as I am Parallely working in random as INDS AS 19 reports for clients. I understood wider concerns & it was a great idea for ICAI Talk.

Time should be kept in margin for questions. We may have less topics but detailed discussion on Standard is required.

More in context of insurance companies doing their own employee benefits & valuation accounting

Assets managements / Investments scenarios.

This was timely, Just right choice

Have more discussion on Asset ceiling with example & more discussion on standard paras.

Should have more emphasis in future changes like impart of OROP if implemented throughout the country in all seminars.

Topics concerned were appropriate. But some suggestions environmental sustainability impact on discount rate & it's in turn effect on retirement benefits.

Further following on Ind AS 19 -Implementation Issues, Professional Guidance, etc.

Great seminar & great opportunity to meet other people from the actuarial fraternity.

Good idea to involve someone from ICAI on accounting standards & issues.

Basics of retirement benefits and valuation revision, Develop standards for adoption, Monitoring practice standards.

Perhaps the ICAI Speakers point of view was particularly interesting.

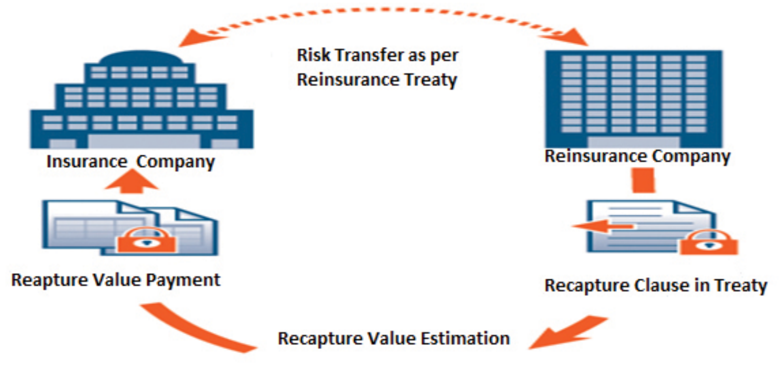
Good event, quite well organized, relevant topics.

Avoid questions by guidance diverting from topics, Avoid questions during presentation which curtains time management.

It is a really informative session. Paper/ research presentation would be a good introduction.

I need a specific session exclusively for insurance companies (Covers both actuarial & marketing) who are in funded scheme business.

# REINSURANCE RECAPTURE VALUE: LIFE INSURANCE COMPANY




The Reinsurance Recapture Value can be defined as the value/amount that the ceding Life Insurance Company needs to pay to its Reinsurer in order to terminate the reinsurance arrangement under a treaty, and to be released from the obligation to cede business to the Reinsurer as per the terms of the Treaty. The basic principle is that the Reinsurer is compensated for abandoning its right from future profits to emerge from the ceded block of business and the ceding Insurer gets an opportunity to make profit out of taking the risk which now fits its risk profile.

## Introduction and Background:

The benefits of Reinsurance, for Insurance Company are numerous, reduction of insolvency risk, increasing risk acceptance limit, reduction of Capital Costs, protection against large losses etc. The underlying purpose of Reinsurance has always been to enable companies to accept risk that are beyond its risk acceptance limit by transfer of Risk to the Reinsurer. There may also be regulatory restrictions, direct or indirect on the risk retention limit of the Company limiting its ability to accept certain risks. However as the company expands and its business grows, the risk acceptance limit is likely to change. This may enable the Insurance Company; to accept potentially profitable risks that were erstwhile not available to it. The Reinsurance Recapture arrangement is a way to bring additional risk that now fits the size of the larger company back to its fold.

The Reinsurance Recapture Value can be defined as the value/amount that the ceding Life Insurance Company needs to pay to its Reinsurer in order to terminate the reinsurance arrangement under a treaty, and to be released from the obligation to cede business to the Reinsurer as per the terms of the Treaty. The basic principle is that the Reinsurer is compensated for abandoning its right from future profits to emerge from the ceded block of business and the ceding Insurer gets an opportunity to make profit out of taking the risk which now fits its risk profile.

## Reasons for Reinsurance Recapture:

As mentioned earlier Reinsurance Recapture arrangement is used to bring back the Risk which is now within the Risk profile of the Company, however there might be a variety of other reasons that may result in recapture, some of the possible reasons can be listed as below

**Reinsurer Insolvency:** Reinsurance Company may not be in a financial position to accept and honour the risk accepted as per the treaty contract.

**Competitive Rates:** The Ceding Insurance Company may have choice of highly competitive Reinsurance rates for the ceded business.

**Regulatory Change:** Reduced capital requirement, enabling the insurer to underwrite higher risk.

**Reinsurer Rating:** Downgrade of Reinsurer rating and hence the safety of ceded risk.

**Rate Review:** Reinsurer may increase the Reinsurance rates.

**Merger and Acquisition:** Any Merger and acquisition activity resulting in an increase in Risk acceptance capacity of the Ceding Company

## Recapture Clause in Reinsurance Treaty

Recapture clause is a standard feature of the Reinsurance Treaty, and the terms and conditions of Recapture value calculation (including the recapture trigger) are likely to be outlined in the treaty. The


key features of the recapture clause in the Reinsurance treaty can be listed as follows:

**Framework of Recapture Value Calculation:** This may include details like outline of method of calculation, role of any third party, time limit within which the reinsurer should provide the recapture value, period for which the recapture value should be applicable, professional guidelines etc.

**Recapture Triggers:** The range of events that may trigger the Recapture, for eg the Reinsurer may not be very keen on including rating downgrade as a trigger.

**Limits on Recapture:** The extent to which the Retention limit can be increased, the Reinsurance treaty may prohibit complete recapture of the Business and allow increase in the Retention limit subject to a ceiling.

**Recapture Waiting Period:** There may be a requirement for a minimum period before the recapture can take place.

**Advance Notification:** Requirement on the part of the Insurance Company to notify the intent to recapture in advance.

**Treatment of Claims:** Treatment of claims occurred before but intimated after the Recapture date and treatment of claims during the transfer.

**Administrative arrangement during the Transfer:** Division of administrative responsibility during the recapture.

**Tax and Reserve Treatment during the Transfer:** The treatment of Reserve during the transfer, i.e. how would the transfer of reserve occur from the Reinsurer to the Insurer during the recapture.

## Reinsurance Recapture Value: Estimation.

The starting point for the calculation would be the value of in-force (VIF) for the business to be recaptured. The Reinsurer would calculate the Recapture Value based on value of in-force (VIF) of the business covered by the treaty concerned, i.e. the present value of expected future profits from the business ceded under the treaty. The calculation of VIF would be done from the Policy data using mutually acceptable set of assumptions, the steps

leading upto the estimation of Recapture Value can broadly be listed as follows:

- Reinsurer may request the ceding company to supply the latest data. If the latest data is not available, then the most recent data would be used post adjustment for expected new business and decrements from the date of extraction to the data of calculation of recapture value. If the data allows, the calculation may be done on per policy basis, else policies can be grouped homogeneously and grouped calculations may be done.
- If the Reinsurance Treaty allows for the Cedance of future New Business, then it needs to be allowed for in the model. This can be estimated using the expected new business volume assumption and the condition of NB Cedance including the retention limit.
- The cash flows to be projected will be reinsurance premiums received less reinsurance claims paid less expenses incurred plus investment earnings plus release of reinsurance reserves. Future cash flows will be projected forward using realistic assumptions and discounted back using an appropriate risk discount rate.
- The assumptions are likely to be based on the latest experience, after allowance for any expected changes in future. Some of the important assumption would be treated as follows
- Mortality/Morbidity experience would be based on treaty's own experience. The reinsurer may not have complete data to enable them to arrive at actual experience, for eg Reinsurer may not have the entire Claims data but have details of only those cases where claim was referred to the Reinsurer. In such case the reinsurer may either ask for the complete data or may use a truncated conditional probability distribution to arrive at the mortality assumption. In case the data is insufficient, the Reinsurer may use the data of business ceded under other treaties.
    - Commission would be based on the term and conditions set under the treaty conditions.
    - Expense Assumptions would be based on share of Reinsurer expenses that can be attributed to the business ceded under the Treaty, allowance need to be made for expense inflation in line with the Reinsurer's expense inflation.
    - Interest rate assumption would be based on expected yield on existing investment and the sums to be invested in future. The assumption would be consistent with expense inflation.
    - Allowance needs to be made for Reserving and Solvency requirement against the business ceded under the Reinsurance Treaty.
- Allowance needs to be made for profit margin of the Reinsurer in risk discount rate.
- Allowance needs be made for any Deposit back, Reserve deposit or profit sharing arrangement between the reinsurer and the ceding company.

## Issues Related to Reinsurance Recapture:

Some of the practical issues faced during the Reinsurance Recapture are highlighted below:

**Scale of Recapture Fees:** There would be a recapture fee or other penalty payments to be paid to the reinsurer.

**Minimum Ceding:** Requirement to cede certain minimum volume of business by the Insurer to the Reinsurer. In such a case it may be necessary to cede alternative business to the reinsurer which may not be advantageous to the insurer.

**Involvement of Retrocessionaire (Reinsurer's Reinsurer):** The Reinsurer may have further insured the risk, if the retrocessionaire wants to retain the risk it would need to be compensated too for giving up the profitable business.

**Alternative Arrangement** – When the Recapture is initiated due to reasons other than bringing back the risk (e.g. downgrading of Reinsurer), the ceding company may have to find alternative Reinsurance arrangements for its business, which may turn out to be an expensive option.

**Change in Capital Requirement** – With the Reinsurance Recapture, the ceded risk is brought back to the fold of the Insurance Company. This is likely to change the Reserving and Solvency requirement of the Insurance Company.

**Experience Refund issues-** If the Reinsurance arrangement contains provision of refund from Reinsurer to Insurer in future on account of favourable mortality experience, then the Recapture may result in cancellation of any such possible benefit transfer.

**Treatment of any supplemental benefits-** There may be other benefits as a part of Reinsurance arrangement for eg providing technical assistance in the area of Insurance. Recapture may restrict such knowledge transfer from the Reinsurer to Insurer.

### Practical Example Reinsurance Recapture:

A Life Insurance Company "True Life" has a Quota share Reinsurance Ceding arrangement for its Non Linked Protection line of Business with "Classic Reinsurance". At the time of entry into reinsurance agreement, which was approximately ten years ago, this line of business was newly launched & True Life did not have much credible data. In absence of credible data, reasonable margins were built into best estimate mortality assumption. The Reinsurance premiums rates at the time of entry into arrangement were similar to the best estimate Mortality assumption of the Insurance Company. However with time the Company has had much better experience than the Reinsurance Premium Rates and therefore, is spending too much on the Reinsurance Premium Rates. The rates were reviewable after 10 years but the Reinsurer did not lower the rate inspite of documented evidence from the Insurer exhibiting better mortality experience (on a sustained basis) than the Reinsurance Premium Rates. The Insurance has hence decided to recapture the business and has written to the Reinsurer to provide the detailed recapture value as per the Recapture clause in the Reinsurance Treaty.

Insurance Company also at its end has calculated present value of the Projected Reinsurance Premiums and Recovery from Reinsurance. Reinsurance Recoveries are based on future expected Claims Outgo as per the latest Mortality assumption of the Company allowing for the Reinsurance arrangement.

Fig in Millions Present Value of losses @9% p.a **₹ 10,048.62**

| Year | Reinsurance Premiums | Recovery from Reinsurance | Loss to the insurer |
|---|---|---|---|
| 1 | 12,534 | 11,000 | 1,534 |
| 2 | 11,950 | 10,458 | 1,492 |
| 3 | 11,046 | 9,491 | 1,555 |
| 4 | 10,762 | 9,218 | 1,544 |
| 5 | 9,827 | 8,235 | 1,592 |
| 6 | 8,918 | 7,317 | 1,601 |
| 7 | 8,140 | 6,554 | 1,586 |
| 8 | 7,331 | 5,722 | 1,609 |
| 9 | 6,394 | 4,804 | 1,590 |
| 10 | 6,175 | 4,531 | 1,644 |

As per the latest Mortality assumptions, the Company is incurring a projected loss of over ₹ 10,000 Mn over the future 10 years.
So, by recapturing, company would save the difference between the P.V of projected losses and the Recapture value paid to Reinsurer as long as the Recapture value quoted is less than the projected losses

This is a simplified example; however there are other factors to be considered detailed earlier in the article, like change in Reserves and Solvency requirement etc before a final decision is made.

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### ABOUT THE AUTHOR


**Ms. Ridhi Paliwal** is an Associate member of the Institute of Actuaries of India. She is currently working as AVP – Actuarial in Aviva Life Insurance.

ridhi.paliwal@avivaindia.com

# LIQUIDITY RISK IN LIFE INSURANCE

## Introduction

Liquidity risk in a life insurance company is considered as less threatening than in bank because of higher frequency of money exchange takes place in banking industry compared to life insurance industry. However, liquidity risk management is equally important in life insurance as in banking sector because of interconnection of financial system leading to cash crisis and secondly liquidity risk may prove very expensive to insurer due to meeting the cost of liquidity and also impacting the Assets and Liability mismatch. This article looks into the various components of liquidity risk management and pieces together various details.

### What is Liquidity Risk?

Liquidity Risk is a risk of insufficient liquid assets to meet payouts from policies (surrender, expenses, maturities, etc.), forcing the sale of assets at lower prices, leading to losses, despite company being solvent. Loss from meeting liquidity comes either from fire sale or by paying interest on borrowing to meet payouts.

### Why liquidity risk arises?

Liquidity risk arises due to two reasons, one on the liability side and other on the asset side.

The liability side of liquidity risk arises due to product design, policyholder's behaviour or through catastrophic events. Many life insurance products such as endowment assurance have surrender value where policyholder's have an option to surrender the policy in between the term of product while other products such as term assurance do not have any surrender value and thus have no liquidity risk due to surrender. The surrendering of policy depends of meeting the policyholder's need and when such needs are not fulfilled leading to surrender. The liquidity risk due to higher death claims occur under catastrophic event such as natural disaster, pandemic, flood etc. could lead to liquidity risk.

The asset side liquidity risk arises due to impairment in the capital market, increase in interest rate, lower than expected new business premium, lower than expected renewal premium or default by reinsurer. In capital market impairment, a previous liquid asset classes become temporarily illiquid or materially less liquid for extended period of time raising even nominal amount of cash can prove to be difficult.

Another important source of liquidity risk is when Life Company is downgraded by rating agencies. The downgrading of the news spread very rapidly in the financial media and reaches the policyholders which may create panic among them leading to higher level of withdrawal and reduced new business sale. This situation could be very dangerous unless management act quickly.

### Measurement of Liquidity Risk

Before taking actions to manage the liquidity risk, it is important to measure the liquidity risk. There could be many ways of measuring the liquidity risk, few are detailed below. Calculating following ratios and cash flows helps in understanding the severity of the risk to take mitigating actions.

1. Liquidity Coverage Ratio (LCR) = (Premiums Collected + Liquid Assets)/Outflows
2. Surrender Coverage Ratio (SCR) defined as = Surrender Value of All Policies/Market Value of assets
3. Monthly cash inflow (Premium plus liquid assets) minus cash out flow (expected out flow) should be positive over next 12 months. Any month's negative surplus should be funded from accumulation of previous months of surplus.

LCR measures the ratio of cash inflow to the company to the cash out flow from the company over the next 12 months period. For the Company to keep meeting the liquidity arising over next 12 months, this ratio should be greater than "1". In a more practical world to stay prudent, the LCR could be targeted to "1.5" by companies.

The Surrender Coverage ratio indicates the extreme end of liquidity position of the Company if all the policyholder surrenders at once. This is a very extreme out flow scenario that tests the liquidity strength of the company. The important point to note here is that if the surrender coverage ratio is greater than "1" does not guarantee liquidity because on arriving such news of mass surrender the company may get lower asset value.

The third method is a matching of monthly cash flow position ensuring no negative surplus through raising extra liquid assets if otherwise.

### Issues with Liquidity Risk Measure calculation

While calculating the above ratios, it is important to recognize how these ratios are calculated. In these ratios calculations, liability is easy to understand as being expected cash out flow from the company; however, correct judgment is required to consider the assets cash flows. If a company assumes that the aggregate available cash over the calculation period is simply a sum of cash provided by each asset classes, there are two issues in this approach. One is, other risks should be considered such as the assets and liability management risk or concentration risk while considering the assumption the liquid assets. The Second issue to consider is, " too much" selling would send the message of distress to the market and the Company may get lower value of assets which should be incorporated in the LCR ratios.

### Stress testing

The measurements described above measures the base liquidity risk however it does not tests the tail risks under the extreme scenario. Using different products, assets and market scenario, stress test describe the 'tail' of liquidity risk facing the company. The stress test will test the Company's expected liquidity adequacy in a extreme market and business condition. Some of the commonly prescribed stress tests under CRO Forum liquidity guidelines are:

- Testing for mass lapse
- Increase in withdrawal due to increase in interest rate, e.g. the interest rate shock could be 300 bps
- Increase in unprecedented demand for cash over the short period of time due to catastrophe events
- Increase in withdrawal rate due to customer panic resulting from downgrade of the Company, falling equity, rising credit spread, catastrophe insurance loss etc.
- Freezing of capital market resulting into frozen assets for a period of 3 to 6 months

These stresses are to be incorporated in the appropriate assets or liability or both in the calculation of measure ratios of liquidity risk.

## Liquidity Risk Management

- CRO forum suggests capital injection to manage the liquidity risk as an ineffective way of managing this risk.
- Investment portfolio at times may not provide liquidity under all the conditions, in this case, cost of securing the liquidity may be reflected in product design and pricing.
- Liquidity risk may be managed through the design of the product, where possible on limiting the surrender value or limiting the number of times surrenders can be made.
- Surrender penalty, surrender change, loyalty additions are some of the commonly used techniques used in the global market to manage unprecedented withdrawals.
- For high value death claims, early payment clause may be inserted with reinsurer to pay the claims say within 15 or 30 days.
- Monitoring regularly, the assets and liability cash flows and LCR ratio for early warning signals.
- Monitoring the credit rating of the corporate bonds provider and reinsurer, and taking corrective action as and when it is necessary
- Allowing adequate liquidity provisioning while designing strategic assets allocation
- Preparing regularly reviewing company's liquidity contingency planning.

## Conclusion

An insurance company may choose to adopt any of the liquidity measurement and management methods suiting to their need; the key point to note is liquidity should not be looked into isolation and care should be taken while considering assets used to measure the liquidity risk.

### ABOUT THE AUTHOR

**Mr. Sonjai Kumar**

Vice President- Business Risk, Aviva Life Insurance Company India Limited

Sonjai.Kumar@avivaindia.com

# The Actuary India – Editorial Policy

## Version 2.00/23rd Jan 2011

A: The Actuary India – Editorial Policy Version 2.00/23rd Jan 2011 A: "The Actuary India" published monthly as a magazine since October, 2002, aims to be a forum for members of the Institute of Actuaries of India (the Institute) for;

a. Disseminating information,

b. Communicating developments affecting the Institute members in particular and the actuarial profession in general,

c. Articulating issues of contemporary concern to the members of the profession.

d. Cementing and developing relationships across membership by promoting discussion and dialogue on professional issues.

e. Discussing and debating issues particularly of public interest, which could be served by the actuarial profession,

f. Student members of the profession to share their views on matters of professional interest by way of articles and write-ups.

B: The Institute recognizes the fact that;

a. there is a growing emphasis on the globalization of the actuarial profession;

b. there is an imminent need to position the profession in a business context which transcends the traditional and specific actuarial applications.

c. The Institute members increasingly will work across the globe and in global context.

C: Given this background the Institute strongly encourages contributions from the following groups of professionals:

a. Members of other international actuarial associations across the globe

b. Regulators and government officials

c. Professionals from allied professions such as banking and other financial services

d. Academia

e. Professionals from other disciplines whose views are of interest to the actuarial profession

f. Business leaders in financial services.

D: The magazine also seeks to keep members updated on the activities of the Institute including events on the various practice areas and the various professional development programs on the anvil.

E: The Institute while encouraging stakeholders as in section C to contribute to the Magazine, it makes it clear that responsibility for authenticity of the content or opinions expressed in any material published in the Magazine is solely of its author and the Institute, any of its editors, the staff working on it or "the Actuary India" is in no way holds responsibility there for. In respect of the advertisements, the advertisers are solely responsible for contents of such advertisements and implications of the same.

F: Finally and most importantly the Institute strongly believes that the magazine must play its part in motivating students to grow fast as actuaries of tomorrow to be capable of serving the financial services within ever demanding customer expectations. Version history:

Ver. 1.00/31st Jan. 2004 Ver. 2.00/23rd Jan. 2011

# USUAL THEORY, UNUSUAL APPLICATIONS: CREDIBILITY THEORY AND MOVIE RANKINGS

## Prologue

The general education system in India unfortunately faces criticism on various grounds, one of the recurrent themes being the wide chasm between theory and applications. However, most statistical topics lend themselves easily to practical applications in myriad and diverse fields. This article will attempt to examine one such application of a topic we encounter in our actuarial curriculum to a field that is as different from actuarial science as chalk is from cheese.

Specifically, we will see how a premier online movie database rates and ranks movies, based on user votes, using the principles of Bayesian credibility studied as part of the subject CT6. Chapter 5 of the CT6 Course Notes deals with credibility theory. While the examples given therein mainly deal with determination of premium, the theory is generic enough to deal with a wide range of practical applications. Here we explore a particularly unlikely domain for an illuminating example.

## IMDb and Movie Ratings

Most cinephiles would have, at some point of time, used the Internet Movie Database (abbreviated as IMDb) [1] to look up movie ratings or ancillary information about movies. Each registered user is eligible to rate each movie. The rating of an individual user entails assigning a positive integer score on a scale of 10, with 10 being the best possible score. Each such rating is also referred to as a vote. For each movie, the average rating from various individual users (say, R) is computed and displayed.

A popular feature of IMDb is its "Top 250" chart [2]. The question of interest to us is: Given the average ratings for each movie (and other data, such as the number of votes for each movie), how should these rankings be determined?

## Layman's Approach – Version 1

A very straightforward and unsophisticated approach to ranking would be to arrange all movies in descending order of their average rating. While this approach is obvious, so are its shortcomings. Consider a little-known movie with just a few votes, but of a high score. An extreme example would be that of just one (or a few) vote of 10 [3]. The average being 10, the movie would, quite undeservingly, be on the top of the list. This is clearly undesirable.

## Layman's Approach – Version 2

As a further refinement, in an attempt to cover our shortcomings, the approach may be modified by stipulating that a minimum number of votes (say, m), be cast for a movie before it becomes eligible to be considered for such a chart. Among the movies that meet the cut-off, a simple sorting according to the average rating is done, as before.

The drawbacks are not so apparent, but this approach is still far from perfect. Consider two movies, M1 and M2, each with an average rating of 8.0, but having a widely different number of votes, say 30,000 and 500,000 respectively. If the minimum number of votes, m, is less than 30,000, both these movies will be treated at par under this approach. However, intuitively we know that there is a significant difference. The rating of M2, having been voted by a much larger number of users, can be better relied upon than that of M1. M2's rating is more credible than M1's, so to speak. It is this notion of credibility that we seek to capture and make precise and rigorous. We would want our approach to not just depend on R and m, but also v (the number of votes received for a movie).

## IMDb's Approach

How does IMDb do it? Let us hear it straight from the horse's mouth. Figure 1 is a screenshot taken from IMDb [2]:

The formula for calculating the Top Rated 250 Titles gives a true Bayesian estimate:
weighted rating (WR) = (v (v+m)) x R r+ (m (v+m)) x C
Where :
R = average for the movie (mean) = (Rating)
v = number of votes for the movie = (votes)
m = minimum votes required to be listed in the Top 250 (currently 25000)
C = the mean vote across the whole report (currently 7.0)
For the Top 250, only votes from regular voters are considered.

Figure 1. IMDb's approach to rating [2]

Note that the weighted rating (WR) used for ranking movies is a weighted average between R (the movie's own average rating) and C (average rating of all movies), so it will necessarily lie between them. R and C are averaged with weights in the ratio v:m. Therefore, a higher v implies more weightage being given to R, than C. This is consistent with our intuition that we can place more reliance on R if v is larger. As v tends to infinity, the weighted rating approaches R. This is reasonable too.

## Resemblance to CT6 Core Reading Example

The formula above is strikingly similar to the one given in the Core Reading of CT6, in the Chapter on Credibility Theory (Chapter 5, Section 1.1). The problem there involves determining the expected cost of claims during the coming year arising from accidents for a fleet of ten buses run in a small town by the local authority. Two pieces of data are available:

1. The average cost of claims per annum for this particular fleet of buses over the past five years was £1600 (or, more generally, X).
2. Over a large number of local authority bus fleets all over the United Kingdom, the average cost of claims per annum per bus is £250, implying an average cost of £2500 (or, more generally, μ) for this fleet having 10 buses.

The credibility approach based answer would be a weighted average of these two extreme answers:

$$Z \times X + (1-Z) \times \mu = Z \times 1600 + (1-Z) \times 2500$$

Here, Z, a real number between zero and

one, is known as the credibility factor. It quantifies the trust we have in the specific and relevant data for that fleet (1600) vis-a-vis the broad-based generic data (2500). The higher the value of Z, the closer the answer would be to 1600. It remains to ascribe a value to Z. That forms the focus of the remaining part of the chapter and involves Bayesian principles.

The same credibility theory which underpins the solution for the expected cost of claims arising from accidents involving the fleet of buses can be used to rate and rank movies. Of course, our discussion so far has been driven largely by intuition. Without a strong and rigorous statistical foundation, it would be worth zilch. So, let us put the foundation in place.

## Bayesian Estimation and Credibility Estimates

Any parameter (say, θ) estimation problem based on some observed data (say, $\underline{X}$) is solved under the Bayesian framework as follows:

1. θ is treated as a random variable. As such, it has a distribution. We have some idea of this distribution even before looking at observed data (that is, $\underline{X}$). We call that the prior distribution of θ.
2. Based on the observed data ($\underline{X}$) and the probability density function (PDF) of X|θ, we then construct the likelihood function, $L(\underline{X}|\theta)$.
3. Bayes' Formula allows us to determine the posterior distribution of θ, having regard to the observed data, $\underline{X}$. The relationship obtained is:

$$\textit{Posterior PDF} \propto \textit{Prior PDF} \times \textit{Likelihood}$$

4. We then stipulate a loss function, to measure the loss/cost associated with an incorrect estimator.
5. Based on the loss function chosen and the posterior distribution, we find the Bayesian estimate of the unknown parameter θ. For the commonly used quadratic error loss, the mean of the posterior distribution is the optimal Bayesian estimate.

This Bayesian estimate is called a credibility estimate if it can (perhaps, after rearrangement) be expressed in the form:

Z×Mean based on Sample data+(1-Z)×Mean of Prior distribution

It turns out that for both the problems, provided that we make appropriate choices for the prior distribution, the likelihood function and the loss function, we obtain credibility estimates of the above form.

The Poisson/gamma and the normal/normal models explained in the CT6 Notes illustrate this approach beautifully. For example, the Poisson/gamma model is so named as to indicate the choice of the likelihood (X|θ follows Poisson(θ) distribution) and the prior distribution (θ follows the gamma(α,β) distribution). The loss function used is, almost always, the quadratic loss function.

## From the General to the Particular

For our movie rating problem, however, we will need the Binomial/beta model. We will provide the roadmap for the approach. Filling up the details and traversing the path will, however, be left as an exercise for the readers.

Let $R_j$ denote the individual rating score by the $j^{th}$ user.

1. Likelihood function: We assume that, for j = 1, 2, ..., v, $R_j|\theta$ are independent and identically distributed as Binomial(10, p). This choice of distribution is consistent with the fact that users can only assign integer scores, on a scale of 10. The likelihood function will depend on v and R (used above), and p. p, then, is our unknown parameter to be estimated.
2. Prior distribution: Since p can take all real values between 0 and 1, we postulate a Beta(α,β) distribution as a prior. The particular values of α and β would be functions of m and C (used above). The exact nature of these functions is to be decided by the reader as part of the exercise.
3. Posterior distribution: Obtained by multiplying the prior probability distribution function and the likelihood function, it comes out to be another Beta distribution with some other parameters, which are to be determined.
4. By use of quadratic loss function, the mean of this posterior beta distribution will be our Bayesian estimate for p. Let us call it q.
5. We are not interested in estimating p per se; we want the rating. The expected weighted rating (for a Binomial(10,p) distribution)would be 10*q.
6. This expression can be rearranged to yield the required formula:

$$\textit{Weighted Rating} = \frac{v}{(v+m)} \times R + \frac{m}{(v+m)} \times C$$

## Comments and Comparison

It is instructive to pause and ponder over the similarity of approach to two completely different problems. In both cases, the theme is that of a tussle between the specific (and hence, very relevant) data and the generic (and hence, not-so-relevant) date. In some sense, it is a trade-off between the quantity of data and its relevance. We seek a balance between the two by appropriately adjusting the weighing by determining the credibility factor. Table 1 aids the comparison of the two problems:

| | Rating Movies | Pricing Fleet Insurance | Place in the Bayesian Framework |
|---|---|---|---|
| **Specific, relevant data** | Average ratings for the particular movie (R) | Average cost of claims for that specific fleet (X) | Sample data, its mean |
| **Generic, broad-based, collateral data** | Average ratings for all movies (C) | Average cost of claims for all fleets in UK (μ) | Prior distribution, its mean |
| **Overall rating/price** | Weighted average of R and C | Weighted average of X and μ | Posterior mean, credibility estimate |
| **Weights** | v/(v+m) and m/(v+m) | Z and (1-Z) | Credibility factor |

**Table 1. Comparison of the two problems**

## Epilogue

The actual ranking process followed by IMDb has, over time, become significantly more complicated than what has been described. In fact, it now stands only as an approximation to the actual ranking approach followed currently, which is not fully revealed to avoid abuse. The additional complication stems from features such as treating votes from different users differently (for reasons such as tackling manipulative voting) and using trimmed means (to reduce influence of outliers). [4]

As regards unusual applications of usual theory, this article merely shows the proverbial tip of the iceberg. More importantly, I firmly believe that the actuarial qualification imparts skills which are applicable in a wide range of fields apart from the customary ones such as insurance and pension. Indeed, it may surprise you that David Kendix, the man charged with devising and maintaining cricket rankings by the International Cricket Council, is an actuary by profession. [5] Perhaps it is time we, as a profession, branded ourselves as professional all-rounders, rather than as experts in a niche field. The message from our President, Dr. Rajesh Dalmia, in the May 2015 edition of The Actuary India is a big step in that direction.

## Postscript

I eagerly await your feedback – good or bad, bouquets or brickbats – on this article, preferably by email. Based on the feedback, I'd like to continue this into a series of articles with more examples of interesting applications.

I'd like to thank Vaibhav Unhelkar [6] for reading drafts of this article and his valuable suggestions and comments.

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ABOUT THE AUTHOR

**Mr. Prasham M. Rambhia**

is an IIT Bombay graduate and an Associate member of IAI . He also holds DAT-Finance and DAT-ERM, and has nearly two years of work experience as a quant at Morgan Stanley.

prashammr@gmail.com

## BIRTH NOTIFICATION

**Nancy Gupta Kapoor,**

student member of the Institute of Actuaries of India; blessed with a healthy baby boy on 26th May 2015, named

**Maurya Kapoor.**

## NON–RECEIPT OF "THE ACTUARY INDIA" MAGAZINE

This is for the attention of Members of the Institute, who fail to receive "the Actuary India" magazine dispatched to them either due to unintimated change of address or postal problems, are requested to inform us on library@actuariesindia.org; so that we can ensure regular and timely delivery of magazine to you.

# FACE TO FACE WITH

## Mr. G Murlidhar
## -MD, Kotak Life Insurance

**G MURLIDHAR, Managing Director, Kotak Mahindra Old Mutual Life Insurance, is one of the founding members of Kotak Life Insurance. Prior to this, he has held several leadership positions in the organization. Over the past decade, Murli has played an instrumental role in establishing a strong operational and service backbone, dovetailing into a highly efficient distribution network for Kotak Life Insurance. Murli has more than three decades of experience across finance, commercial, projects, marketing, HR, IT, and consumer distribution. He has also handled public issues and open offers across sectors such as BFSI, services and manufacturing. Murli is a Chartered Accountant, ICWA and Company Secretary. His interests include reading and playing chess.**

### PERSONAL

**? What are the key qualities one should possess to be a successful CEO of a Life Insurance Company?**

A CEO should have a clear **corporate vision,** which is beneficial to people at all levels in the organization. For this the CEO needs to have a clear perspective of his company's current position and the direction in which it is heading, so that he can map the path between the present and the future.

It's imperative for a CEO to **know the customers** and **assess their needs.** Understanding customer requirements will help the CEO develop a strategy that will optimally help address their needs.

A CEO should also be able to **inspire and motivate** the people around him. Inspiration and motivation are important factors to help employees perform better.

People respect and highly value an **honest, impartial and ethical** leadership. These traits help a CEO maintain transparency in an organization and treat each employee equally, inspiring them to perform better and aim higher. He should be **proactive, analytical** and also a **good mentor.**

**? What are your hobbies?**

Travelling, reading and occasionally playing chess are my favorite leisure activities.

**? How do you manage your work-life balance?**

Time management is extremely important to structure one's work-life balance. I make a list of the tasks that I need to accomplish on a priority basis. I then structure my day, making a virtual time boundary for each task on the list. It's a habit that I cultivated when I was young and which I follow till date.

During weekends, I prefer spending quality time with my family. There's nothing more exhilarating than playing a game of chess with my children. I also devote some time for reading and keeping myself updated and happy.

To summarize, I simply love what I do. I identify what's important and make sure it happens on time. Seizing the moment is my mantra of keeping things simple and enjoying every day.

### PROFESSION

**? What can you tell us about the future employment outlook in insurance sector for actuaries?**

Actuarial proficiencies are fundamental to all insurance companies. The talent for actuarial is a niche skill and the talent pool is limited. Therefore, actuarial science as a career, has great opportunities in the insurance sector that has a rapidly changing risk landscape. Today, most insurance companies offer actuarial schemes in terms of support for exam clearance and exam leaves besides learning/exposure on the job. According to the USA Bureau of Labor Statistics (BLS), the actuary segment will see a higher than average growth of around 26% between now and 2022. As the career scope improves, actuaries will be expected to handle the development, pricing and evaluation of new insurance products, its risks and find ways to mitigate them.

**What do you consider to be the key areas where actuaries add value to a life insurance company's business?**

With FDI and insurance infiltration going up due to relatively better awareness, the outlook for India's insurance sector looks positive. Actuaries are indispensable to the insurance industry as they help businesses evaluate the risk of certain events occurring and to formulate policies that diminish the cost of that risk. Actuaries are increasingly playing an important role across business areas. Using their broad knowledge of statistics, finance and overall business risk management; actuaries help design insurance policies, pension plans, and other financial strategies to ensure that the plans are maintained on a sound financial basis. Their inputs are essential when determining the risk functions, financial analysis and management under Solvency II regimes, analyzing and crunching Big Data, and product development.

**How do you think Institute of Actuaries of India (IAI) can support better its members?**

In India, there is an increase in demand for skilled actuaries as multinationals grow and expand their businesses into new territory. The changes to the Insurance Act only serve to support this growing demand. To empower the actuaries in India, the Institute of Actuaries of India, could associate with organizations across industries to help meet the demand for actuaries. The IAI can also train individuals with a diverse set of technical skills, and prepare them for a different career path as those who hold a professional actuarial qualification have very good prospects as the demand is greater than supply for actuaries.

## INSURANCE INDUSTRY IN INDIA

**What trends do you see for this industry in the next 3 to 5 years?**

- Indian insurance industry is expected to make the onboarding of the customer a pleasant experience, thereby reducing the acquisition and policy issuance cost
- It is expected that the Insurance industry will invest a larger share of their expense on digitization, making processes easier, having faster turnaround time, and lower processing cost.
- We expect increased usage of computing equipment like Tablets/Laptop/Smart Phones for insurance need assessment of potential policyholders.
- Insurance Amendment Bill will aid increased participation of overseas joint-venture partners to raise their stake to 49%. This will provide needed capital to smaller companies to pursue aggressive expansion plans
- It is likely that some companies would like to get themselves listed on stock exchange, thereby opening a new chapter in the insurance Industry
- The role of actuaries in Indian insurance industry will become even more critical, generating an even greater need to have skilled actuaries in the market

**What are the top three issues facing the Insurance sector in India.**

Today, customers don't want to buy insurance the way the insurance companies want to sell it to them.

- Insurers should track customer preferences and accordingly develop the channel focus to meet the ever evolving customer's demand
- Unaware customers have to be educated about insurance and how it works
- Issue of mis-selling has to be completely eradicated from the insurance industry

**What do you think are the strengths of Indian Insurance Industry?**

The Indian insurance industry consisting of 24 life insurers and 28 non-life insurers is projected to touch US$ 350-400 billion by 2020 from US$ 66.4 billion in FY13. With life expectancy reaching 74 years, India's insurable population is anticipated to touch 75 crore in 2020. Furthermore, life insurance is projected to comprise 35% of total savings by the end of this decade.

With the liberalization and entry of private companies in insurance, the Indian insurance sector has started showing signs of significant change. Ever since the opening up of the insurance sector to the private and foreign players, the Life insurance industry in India is experiencing aggressive strategic and innovative marketing practices for a larger market and opportunity share by concentrating to develop their capabilities of access-based penetration and distribution. This in turn is contributing in awareness and thus the inquisitive customers are showing interest in this industry.

Demographic factors such as emergence of an affluent middle class, young insurable population and growing awareness of the need for protection and retirement planning will support the growth of Indian insurance.

The future looks interesting for the life insurance industry with several changes in regulatory framework, which will lead to further change in the way the industry conducts its business and engages with its customers.

**What market share do you see the private sector players having in ten years' time?**

The market share of the private sector players has been increasing and I am sure it will keep growing in the future.

> Laughing faces do not mean that there is absence of sorrow!
> But it means that they have the ability to deal with it.
>
> - Shakespeare.

# ADVISORY GROUP ON HEALTH CARE INSURANCE

Health Insurance in its strict sense is a way to finance health care needs. However, if we look into it closely, Health Insurance is part of wider Health Care System which is globally an emotive topic with lot of high stake involvement. In India, Health Insurance is still considered in its nascent stage with enormous scope to grow. Health Insurance Industry with handful of players is just shaping up and has a long way to go to be compared with those of some of the developed countries.

We at Health Care Advisory Group try to do our bit to contribute for the growth of the industry. As a part of our ongoing efforts in this direction we have recently organized a two day event in Gurgaon in the last week of August 2015. The two days were full of thought provoking discussion.

The first day was on discussion related to Current Issues that Health Insurance is facing. We deliberated and discussed key challenges faced by the industry, like, maturing portfolio, provider induced inflation, high expense ratio, managing cost of distribution, etc. At the same time experts also suggested the solutions to each of these issue. Innovation is of paramount importance not only in product but in processes as well. Speakers shared their views on how can we make ongoing innovation a way of life while managing health insurance portfolio. There was also a panel discussion to deliberate on the recommendations of Expert Committee on Health Insurance Regulations. Reinsurance of Health Portfolio and Cardiovascular diseases were another two important issues discussed in the first day.

The second day was devoted to technical topics. Health Insurance is considered to be a complex subject and there certainly is need to create capacity in actuarial fraternity related to this. There was due emphasis on pricing health insurance product with presentations specifically covering the timing of price correction and what to consider while setting assumptions. Another important topic of coverage of 'Pre-existing Disease' was dealt with in depth. There was also deliberation on Affordable Care Act of US (popularly known as Obamacare) and key takeaway for us. There was also a talk on how actuaries can get involved in other related areas, case in point being using predictive modelling to identify frauds.

There were also discussions around Universal Health Insurance scheme and what can be short and medium term impact of such schemes on the Health Insurance Industry as a whole. Overall these were two days packed with lot of insights related to health insurance. The feedback we have got is quite encouraging. It is indeed heartening to note that participants feel that such sessions should be held twice in a year instead of current practice on yearly.

I come across many students who feel that the non-availability of India specific material for SA-1 subject is a challenge that they face while preparing for it. I acknowledge that this is a limitation at present but we cannot provide solution in near terms. However, my suggestion to them is that they should participate in such events. For those who are not working in core Health Insurance but want to update themselves with what is latest happening in this domain, such forums are equally useful as for those who are working in this area.

We at Health Care Advisory Group are committed to work towards advancement and growth of this important line of business. We also advise the Institute (IAI) on business or industry issue or any other emerging professional issue affecting Health Care Insurance industry within and outside India.

ABOUT THE AUTHOR

**Mr. Vishwanath Mahendra**

Chair - Health Care Advisory Group, Appointed Actuary & Chief Risk Officer, Apollo Munich Health Insurance Co. Ltd.

vishwanath.mahendra@apollomunichinsurance.com

## PEOPLE'S MOVE

## Ms. Aparna Mhatre

I have resigned FROM **M/S K. A. PANDIT** consultants and Actuaries. Currently taking a break. I have worked in organisations like BIRLA SUNLIFE LIFE INS. CO., ICICIPRUDENTIAL LIFE INS. CO., LTD. L. I. C. OF INDIA. The areas I have worked on are: pricing, valuation of liabilities for different jurisdictions like India, Sri Lanka, Nepal, Gulf countries, Zimbabwe. RBC consultation and regulatory submissions, financial condition report, asset Liability Management report , embedded value computation and appraisal value. Prophet modeling, training and auditing.

# PLACE AN ADVERTISEMENT IN ACTUARY INDIA MAGAZINE

- Send detailed art work: library@actuariesindia.org.
- Periodicity: Monthly
- Cutoff date: usually a month in advance for the following month.
- Format: PDF and CDR format
- Size:
  Half Page - 5”( Height) x 7.25” (Width)
  Full page 11.75” (Height) x 8.25 (Width) (cut size)
- Charges :
  Full Page Colour - ₹ 30,000/-
  Half Page Colour ₹ 20,000/-

The magazine release date (hard copy) is 23rd of every month. The advertisement will be uploaded and emailed by 15th of the month to all the members.

# VOLUNTEERING OPPORTUNITIES

IAI invites its fellow members and qualified actuaries of IFoA, UK and IAA, Australia to join in its Volunteering Opportunities Initiative. Through this platform, members will be able to share ideas, gain a broader perspective and experience of work outside their own specialist area, through networking with peers, gain CPD hours and be able to give something back to the profession. We invite members who respect the IAI values and what it stands for and wish to take the profession to newer heights of success through their willingness to share their knowledge and/or skills by working in partnership with peers/colleagues.

If you are interested in applying, please visit our website for more details: www.actuariesindia.org

# *We invite articles*

We invite articles from the members and non members with subject area being issues related to actuarial field, developments in the field and other related topics which are beneficial for the students of the I nstitute.

The font size of the article ought to be 9.5. Also request you to mark one or two sentences that represents gist of the article. We will place it as ‘break-out’ box as it will improve readability. Also it will be great help if you can suggest some pictures that can be used with the article, just to make it attractive. Articles should be original and not previously published. All the articles published in the magazine are guided by EDITORIAL POLICY of the Institute.

The guidelines for submitting the articles are available at http://actuariesindia.org.in/subMenu.aspx?id=106&val=submit_article

# PUZZLE

**Puzzle No 237:**

You walk upwards on an escalator, with a speed of 1 step per second. After 50 steps, you are at the end. You turn around and run downwards with a speed of 5 steps per second. After 125 steps, you are back at the beginning of the escalator.

How many steps do you need if the escalator stands still?

**Puzzle No 238:**

From a book, a number of consecutive pages are missing. The sum of the page numbers of these pages is 9808.

Which pages are missing?

shilpa_vm@hotmail.com


**MR. G. N. AGARWAL**

**MR. N. C. DAS**

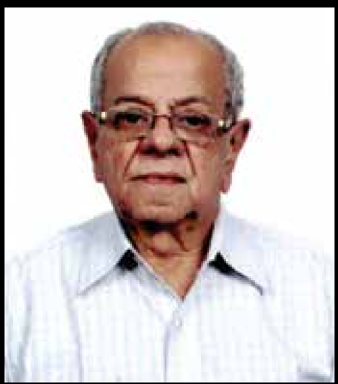
**MS. ASHA J. JOSHI**

**MR. V. K. VYDIANATHAN**

**THE ACTUARY INDIA WISHES MANY MORE YEARS OF HEALTHY LIFE TO THE FELLOW MEMBERS WHOSE BIRTHDAY FALL IN SEPTEMBER 2015**


We invite readers to respond briefly to our articles and to suggest new features with letters to the editor. Kindly mail your responses on library@actuariesindia.org with your name & contact details. Appropriate responses will be published in Actuary India magazine with the approval of competent authority.

# OBITUARY



MR. A. V. GANAPATHY
(26.07.1936 - 08.09.2015)

## LEFT FOR HEAVENLY ABODE

**Mr. Aiyer Vaidyanathan Ganapathy,** 80 left for heavenly abode on 8th September 2015 at Bengaluru. He was born on 26th July 1936 and retired as Executive Director (Actuarial) from LIC of India in 1996. Since then he has been actively practicing Employee Benefits & Life Office. He was great & at the same time very humble man, always understanding & helping others. He is survived by daughter Mrs. Smita, son in law Mr. Vishwanath & granddaughter Ms. Damini.

- By Mr. Y. K. Lele

नेशनल इंश्योरेन्स
National Insurance

नेशनल इंश्योरेन्स कंपनी लिमिटेड
(भारत सरकार का उपक्रम)
पंजीकृत एवं प्रधान कार्यालय : 3, मिडिलटन स्ट्रीट, पो. बा. नं., 9229 कोलकाता-700 071
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**Requires**

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National Insurance Company invites Applications from resident India Citizen for the post of 'Consulting Actuary' on full time/part time basis for a period of 1 Year.

| | |
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| **Name of the Post** | Consulting Actuary |
| **No. of Post** | One Post |
| **Age ( as on 1/1/2015)** | The candidate should not be over the age of 65 years |
| **Qualification** | The candidate should at least be an "Associate" member of Institute of Actuaries of India or Institute and Faculty of Actuaries, London. |
| **Experience** | The candidate should have minimum 2 years post qualification experience in General Insurance Industry and should have sound knowledge of<br>• Pricing, Reserving, Modelling<br>• Regulatory requirements such as FCR, EC, ALM etc. |
| **Emoluments and Benefits** | Negotiable. Please indicate your expectations. |
| **Service Conditions** | • Should be a resident of India.<br>• In case the appointment is on part time basis, he should visit Actuarial Dept, HO, Kolkata at least once in a month for a period not less than 3 days and whenever necessary. |
| **Selection Procedure** | The selection procedure shall be by personal interview. |
| **How to Apply** | Complete application on foolscap paper typed in CAPITAL LETTERS, along with a recent photograph & copies of requisite certificate/documents should reach the following address on or before **31.10.2015**. The envelope should be super-scribed in the top corner "NICL – Consulting Actuary".<br><br>To,<br>Shri Sukanta Mishra,<br>Chief Manager, Personnel Department,<br>National Insurance Co. Ltd<br>3 Middleton Street Kolkata 700 071.<br><br>Softcopy of Resume should also be mailed to sukanta.mishra@nic.co.in |

General Instruction:

1. Company reserves the right to restrict the number of candidates to be called for interview.
2. The decision of the Company will be final and binding in all the matters.
3. In case it is found at any stage of recruitment that the candidate does not fulfil the eligibility criteria and/or he/she has furnished any incorrect/false/incomplete information or has suppressed any material fact(s), the candidature will stand cancelled. If any of these shortcomings are noticed even after appointment his/her services are liable to be terminated forthwith. Before applying for any post, the candidate should ensure that he/she fulfils the eligibility and any other norms mentioned in this advertisement. The decision of the Company in respect of the matters concerning eligibility of the candidate, the stages at which such scrutiny of eligibility is to be undertaken, the documents to be produced for the purpose of conduct of interview selection and other matters relating to recruitment will be final and binding on the candidate.
4. The Company shall not entertain any correspondence or personal enquires. Canvassing in any form will disqualify the candidate.
5. For advertisement, refer to recruitment section of our website: www.nationalinsuranceindia.com

**HR Department, Head Office**

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