Direct Testimony and Schedules
R. Evan Inglis

Before the Minnesota Public Utilities Commission
State of Minnesota

In the Matter of the Application of Northern States Power Company
for Authority to Increase Rates for Gas Service in Minnesota

Docket No. G002/GR-21-678
Exhibit___(REI-1)

Pension Investments

November 1, 2021

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Schedule

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND OCCUPATION.

A. My name is R. Evan Inglis. I am an actuary and investment professional employed by Pension Benefit Guaranty Corporation, and I work as an independent consultant where I use my experience as an actuary and investment expert to help manage risk based on specific investment objectives such as paying pensions and securing retirement spending. I work to develop solutions for the benefit of my clients, and I look for ways to contribute to improve practice in the actuarial and investment professions. I also write white papers and articles, as well as speak publicly about pension plans, pension risk, and investment strategies.

Q. PLEASE SUMMARIZE YOUR QUALIFICATIONS AND EXPERIENCE.

A. I am a Fellow of the Society of Actuaries (FSA) and a Chartered Financial Analyst (CFA Charterholder). I attained my FSA designation in 1990 and became a CFA Charterholder in 2011. I have over 30 years of experience working with pension plan sponsors on issues such as liability and cost measurement, plan design, pension accounting, funding strategies, and investment strategies. Included in my work experience, I have:

- educated thousands of pension and investment professionals about pension investment strategies through webcasts and presentations at conferences, in-person meetings, and phone conversations;
- designed, implemented and monitored investment strategies for dozens of pension funds;
- discussed and recommended strategies with professionals representing dozens of additional pension funds;

- written white papers on subjects such as management of pension risk, effects of the demographic profile of a pension plan population on the investment strategy, investment glidepath de-risking strategies, immunization investment strategies, investment strategies for terminating pension plans, and investment strategies for cash balance pension plans;
- spoken publicly on the previously mentioned topics, as well as topics such as evaluating the success of liability-driven investment strategies, stochastic modeling of pension risk, pension investment strategies in a low interest rate environment, pension investment risk from a corporate finance perspective, and risk-based frameworks for decision-making about pension plan investments and plan design;
- testified before the ERISA Advisory Council on the employer's perspective in pension de-risking trends;
- testified for the Government Accounting Standards Board on accounting standards for government pension plans;
- worked with some of the world's largest pension plans and advised the sponsors of those plans about pension risk; and
- been retained by the World Bank and other organizations to assist with matters related to pensions, investments, and retirement systems in developing countries such as Costa Rica, India, and Indonesia.

I have recently been a member of the Board of Directors of the Society of Actuaries (SOA) and the Board liaison to the SOA's Investment Section Council, which directs research and education on investments for the actuarial profession. In 2014, I established a continuing education committee for the SOA's Investment Section and chaired that committee for two years. I have been a member of the American Academy of Actuaries (AAA) Public Interest Committee and a regular contributor to issue briefs on public policy issues related to pensions for the AAA. I have been the chairperson for the Pension Finance Task Force jointly sponsored by the SOA and AAA. In the past, I have been elected to the SOA's Pension Section Council and appointed to the AAA's Pension Practice Council. My resume is attached as Exhibit___(REI-1), Schedule 1.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am testifying on behalf of Northern States Power Company - Minnesota (NSPM or the Company).

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to provide an independent, third-party opinion regarding whether the investment strategies and target asset allocations for the Company's pension funds are reasonable, based on the demographics of the Company's workforce and other relevant factors.

Q. HAVE YOU PREVIOUSLY PROVIDED TESTIMONY REGARDING THE INVESTMENT STRATEGIES FOR AND TARGET ASSET ALLOCATIONS IN THE COMPANY'S PENSION FUNDS?

A. Yes. In the Company's 2013 rate case, the Minnesota Public Utilities Commission (Commission) issued an Order Point that required the Company to address the reasonableness of its target asset allocations in the Company's next rate case. More specifically, in Docket No. E002/GR-13-868, the Commission issued the following Order Point that is relevant to my testimony:

11. In the initial filing of its next electric rate case, the Company shall:

a. Address why the target asset allocations for its pension fund are reasonable, including ages of retirees and employees. The Company must provide an update to its existing Exhibit 31 (Tyson Rebuttal), Schedule 1 and expand it to include this demographic information.

b. Provide testimony on its investment strategies and target asset allocations for the qualified pension fund and the justifications for these decisions, for the period from 2007 to the date of its next filing.

I provided testimony on these topics in the Company's 2015 electric rate case. While this specific requirement did not apply, I was again asked to review the target asset allocations and provide an opinion regarding whether those allocations were reasonable in the Company's 2019 and 2020 electric rate case filings, which were subsequently withdrawn. In this current rate case, the Company has again asked me to review its investment strategies and determine whether they are reasonable.

Q. DID THE COMPANY PROVIDE YOU WITH INFORMATION BY WHICH TO ASSESS THE REASONABLENESS OF THE TARGET ASSET ALLOCATIONS?

A. Yes. The Company provided me with the following information to help me analyze the reasonableness of the Company's target asset allocations:

- Investment policy statements (IPS), including all amendments made as they were amended from time to time.
- Funded status and changes in both the Company's pension assets and pension liability (which is sometimes referred to as the pension benefit obligation, or PBO) on an accounting basis for 2007 – 2020.
- A breakdown of the pension plan liability according to benefit formula.
- Materials, including presentations by the investment consultant and minutes from several investment committee meetings over the period 2007 – 2020.

- Information on the assets used for interest rate hedging in the Immunization Portfolio.
- Demographic information, such as counts, average age, and average service for the active, terminated, and retired participants in the Xcel Energy Pension Plan (XEPP).
- The Summary Plan Description (SPD) for the XEPP.

I also reviewed research reports from Willis Towers Watson with information about the asset allocation and investment returns for corporate pension plans in the U.S.

In addition to reviewing the materials, I was given the opportunity to speak with Company representatives regarding the current and prior investment strategies and the target asset allocations.

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. I have considered the Company's investment strategy and asset allocation, based on the materials provided, and I found the stated strategy and asset allocation to be reasonable over the relevant time period. The strategy demonstrates key best practices, such as an understanding of how to measure investment risk relative to the pension liability and the significance of funded status on the desired level of risk. The basic approach is similar to that of other large pension funds throughout the relevant time period.

I analyzed the Company's target asset allocation as of the end of 2020 and the changes to the target asset allocation since the beginning of 2015. I have considered several key factors that should influence the asset allocation of any pension plan:

- Plan liability characteristics.
- Demographic profile of the participants.
- Status of the plan (open, closed, or frozen).
- Size of the plan relative to the size of the plan sponsor's business.
- Funded status of the plan.

As with my prior analyses, I found that the Company's asset allocation is reasonable and that the Company's approach to determining asset allocation reflects current best practices.

II. INVESTMENT STRATEGIES

Q. WHAT TOPIC DO YOU DISCUSS IN THIS SECTION OF YOUR TESTIMONY?

A. I describe the Company's current investment strategy for its pension funds and provide my opinion on the reasonableness of that strategy. I also address the reasonableness of the Company's investment strategies and the changes in those strategies from 2015 to the present.

Q. HAS THE COMPANY OUTLINED ITS INVESTMENT STRATEGY IN ANY DOCUMENTS THAT YOU HAVE REVIEWED?

A. Yes. A fairly complete picture of the investment strategy can be derived from the documents provided by the Company that are listed earlier in my testimony.

Q. WHAT FACTORS SHOULD THE COMPANY CONSIDER WHEN DECIDING WHAT ITS INVESTMENT STRATEGY SHOULD BE?

A. The investment strategy should define risk in the right way relative to the pension liability and identify tools that are useful to manage risk to a level that is appropriate for pension fund stakeholders. The return objectives should be consistent with the level of risk determined. Some of the key factors to consider include:

- the fiduciary duty to secure benefits promised to the participants;
- the risk that funding requirements will be uncertain or volatile, thereby disrupting the plan sponsor's business; and
- the perspective that the plan sponsor's shareholders or other financial stakeholders, such as customers, might have on pension risk and investment returns.

Q. CAN YOU DESCRIBE HOW THE XEPP INVESTMENT PORTFOLIO IS GENERALLY STRUCTURED?

A. Yes. The XEPP investment portfolio is part of a larger portfolio for a master trust that covers four plans. The portfolio for each plan is organized into three primary sub-portfolios:

(i) Growth Portfolio, where specific asset classes are intended to achieve higher returns by taking more risk and through the impact of broad-based U.S. and international economic growth;

(ii) Immunization Portfolio, where specific asset classes are intended to change in value in a manner similar to the projected pension liability as interest rates change in order to stabilize and protect the funded status of the plan; and

(iii) Liquidity Portfolio, where the assets serve as a cash reserve with a stable value to fund monthly cash benefit payments.

Q. WHAT IS THE COMPANY'S CURRENT INVESTMENT STRATEGY, AS YOU UNDERSTAND IT?

A. At a high level, the Company uses a long-term investment horizon and evaluates risk in an asset-liability framework in which the change in the value of assets relative to the value of the liability is more important than the change in value of the assets alone. In other words, changes in the pension plan's funded status (assets – liabilities) are the measure by which results and risk are measured. The strategy uses "interest rate hedging" where the value of some assets change in the same way as the value of the liability when interest rates change as a way to stabilize the funded status. The level of interest rate hedging is referred to as the "hedge ratio" which would be 100 percent if the hedging assets reacted to interest rates exactly like the liability does.

The strategy also targets relatively high returns with a significant allocation to riskier growth assets. While it is challenging, a successful strategy would, over time, grow the assets faster than the pension liability but would also keep contributions relatively stable and predictable. The strategy is dynamic and designed so that seeking returns and reducing risk can be balanced and controlled. Both the level of interest rates and funded status are used as key factors in determining how much risk to take.

Q. WHAT TOOLS DOES THE COMPANY RELY ON TO IMPLEMENT THAT STRATEGY?

A. The Company pursues its dual goals of pursuing growth while mitigating risk relative to the liability by allocating its investments between the Growth

Portfolio, the Immunization Portfolio, and the Liquidity Portfolio as described above. The Growth portfolio is relatively large and very diversified and has been adjusted in recent years based on market conditions for the various asset classes. While the Company does not formally incorporate funded status into its strategy through a stated "glidepath" to determine the portfolio allocations to Growth and Immunization, funded status is still used as a key factor for this determination. The Company has also adjusted the level of interest of rate hedging based on interest rate "triggers," where the level of interest rate hedging is increased when interest rates rise to certain levels. The Company uses some of the top pension expertise available from Goldman Sachs Asset Management (GSAM) to advise on and implement their strategy.

Q. DO YOU CONSIDER IT APPROPRIATE FOR THE COMPANY TO RELY ON PENSION ADVISORS SUCH AS GOLDMAN SACHS ASSET MANAGEMENT?

A. Yes. Managing a pension fund is complex and requires information, resources, and expertise that is not directly available to the Company without hiring an advisor. Rankings and analysis of investment managers, ALM (asset-liability modeling) tools and actuarial expertise are some of the main resources that the Company is able to access by using an advisor. In addition, an advisor evaluates a wide variety of pension fund managers and can assess whether they and their strategy(ies) are appropriate for any particular pension plan.

Q. BASED UPON YOUR EXPERIENCE AND EXPERTISE, IS THE COMPANY'S CURRENT INVESTMENT STRATEGY REASONABLE?

A. Yes. In my opinion, the strategy is reasonable because both pension plan participants and the financial stakeholders of the Company are well-served by a balanced approach to seeking returns and reducing risk. The balanced approach is also dynamic such that the balance between seeking returns is adjusted based on key factors as described above. The relatively large allocation to growth assets is appropriate for and more common for plans that are still open to new participants. Using funded status, and asset returns relative to pension liability growth to understand risk and measure results is the appropriate approach for a pension plan. Other managers of large pension funds use similar strategies.

Q. HAS THE COMPANY'S INVESTMENT STRATEGY FOR ITS PENSION PLAN CHANGED OVER TIME?

A. Yes, but not significantly. It would be more appropriate to say that the same strategy has been in place since the market turmoil in late 2008, but has evolved and been adjusted as market conditions have changed. The overall strategy has been defined by a long-term, diversified approach to seeking returns, with risk measured by changes in funded status, using specific allocations to growth assets and hedging assets. After 2008, the separate Growth and Immunization portfolios were created to be more explicit about the portfolio objectives and the balance between risk and return.

In addition, separate portfolio allocations were developed for each of the four pension plans, allowing the balance between risk and return to more accurately reflect the plan provisions, demographics of the plan population, funded status and other factors. This has not changed. The overall target level of risk has been adjusted from time-to-time as has the approach to seeking returns.

Q. Do you consider the Company's investment strategies during the period 2015 – 2020 to be reasonable?

A. Yes. The Company's investment strategy has been reasonable considering the characteristics of the plan, the economic environment, and typical practices of pension fund investment managers during this period. The overall approach of using separate portfolios for growth and interest rate hedging is common practice. The allocation between those portfolios is similar to other pension plans and is reasonable given the interest rate sensitivity of the plan, the funded status of the plan, and the fact that it is still open to new participants. A set of interest rate triggers, as described above, is a common approach to adjusting the level of interest-rate hedging by pension plans.

Q. Have you evaluated the reasonableness of the Company's prior investment strategies?

A. Yes. I have previously examined the Company's investment strategies prior to 2015 as outlined in the materials provided to me by the Company, including testimony filed by Company witness Mr. George Tyson in the 2015 rate case, and found the strategy during that period to be reasonable and similar to other large pension plans.

Q. Has the Company's investment strategy performed as expected during the period 2015 - 2020?

A. Yes. The Company's investment strategy performed as expected with the hedging assets increasing and decreasing in value as interest rates changed with improvements in funded status being driven by strong returns in the Growth Portfolio, above the interest-rate driven increases in the liability. Lower interest rates pushed the liability higher during this period, but the immunization portfolio offset much of that increase, as it is designed to do. The overall funded status for the plan increased significantly during the period, but a more relevant indicator for the investment strategy is the change in funded status due only to investment returns and changes in the liability due to interest rates. This "market-driven" change in funded status was also positive. During this period, equity returns, and in particular U.S. equity returns, were relatively high, which created positive market-driven changes in funded status and pushed up the overall funded status for most large pension plans.

As expected and desired, investment returns for XEPP were higher in years where the liability increased more and lower in years when the liability increased less or decreased. The use of interest rate triggers also worked well as it resulted in increases in the interest rate hedge when it was less expensive to purchase those hedging assets, and, prior to drops in interest rates, so that more of the increase in liability value was hedged by an increase in asset values. The performance of the XEPP portfolio was similar to the performance of other large pension funds during this period. It should be noted that even a well-designed strategy may fail to meet its objectives, especially when measured over shorter time periods.

III. TARGET ASSET ALLOCATIONS

Q. WHAT TOPIC DO YOU DISCUSS IN THIS SECTION OF YOUR TESTIMONY?

A. I address the reasonableness of the Company's current target asset allocation for its qualified pension funds during the period 2015 - 2020. A table summarizing the asset allocation for the XEPP during this period is attached as Exhibit___(REI-1), Schedule 2.

Q. WHAT FACTORS SHOULD THE COMPANY CONSIDER WHEN DECIDING WHAT ITS TARGET ASSET ALLOCATION SHOULD BE?

A. The target asset allocation should have an appropriate and reasonable level of risk, as defined by the investment strategy. To achieve an appropriate and reasonable level of risk, a number of factors should be considered:

- the funded status of the plan;
- the status (open, closed, or frozen) of the plan;
- the size of the pension plan relative to the size of the plan sponsor's business;
- the financial health of the pension plan sponsor;
- liability profile of the pension plan formula;
- the duration (interest rate sensitivity) of the plan liability; and
- the demographic profile of the pension plan participants.

In addition, most plan sponsors evaluate market conditions and assess the potential for return from different asset classes and make adjustments as these factors change.

Q. IN YOUR OPINION, IS THE COMPANY'S TARGET ASSET ALLOCATION REASONABLE, INCLUDING CONSIDERATION OF THE DEMOGRAPHIC PROFILE OF THE PLAN PARTICIPANTS?

A. Yes. The Company's current asset allocation appears reasonable in light of the various factors that I described above. A range of different asset allocations might be considered reasonable, and the Company's current target is comfortably within that range. XEPP is still open to new participants and this is a key factor that underlies how much risk is being taken in order to achieve higher returns since it extends the investment time horizon.

Q. HAVE YOU ALSO REVIEWED THE COMPANY'S TARGET ASSET ALLOCATION FOR THE YEARS 2015 - 2020?

A. Yes. Generally, the target asset allocation has remained the same with relatively minor adjustments during this period. The biggest change has been the increase in the level of interest rate hedging. Since 2015, the following key changes have been made:

- There was a shift from corporate bonds to government bonds and derivatives in the Immunization Portfolio, although the hedge ratio remained about the same, in 2015.
- Exposure to commodities was reduced in 2016 and then eliminated in 2017.
- The small allocation to investment grade (core) debt was eliminated in 2017.
- A set of interest rate "triggers," whereby interest rate hedging is increased when rates go up, was added in 2016 and refined and extended in 2017.
- The level of interest rate hedging was increased late in 2016 and late in 2018 based on the interest rate trigger mechanism.
- The allocation to hedge funds was reduced in 2018 and the allocation to return seeking fixed income in the Growth Portfolio was increased.
- In 2019, the allocation to the Immunization Portfolio was increased (with a corresponding decrease to the Growth Portfolio). Also, a portion of the Immunization Portfolio was reallocated toward corporate bonds, away from Treasuries and derivatives.
- For 2020, the Growth Portfolio was adjusted by reducing high yield debt to allow for a new allocation to private credit and slightly altering the makeup of the equity allocation, shifting away from emerging market equities and into US large cap equities.

Q. Was the Company's target asset allocation reasonable during the period from 2015 to 2020?

A. Yes. The materials that I reviewed provide good reasons for each of the changes based on market conditions and other factors. Some investors engage in more frequent tactical changes (short-term adjustments to or deviations from the overall strategy or target allocation) than others, and these may or may not result in gains over time. Frequent tactical changes might detract from overall strategic goals and increase costs, but the GSAM advisors do not appear to recommend, and the XEPP plan has not engaged in, frequent tactical changes. The changes are usually seen as permanent changes based on new conditions that are expected to be long-lasting or permanent. More specifically, referring to each of the changes described above:

- The shift away from corporate bond exposure in 2015 was based on the level of corporate bond spreads. In late 2014, GSAM viewed spreads (the extra yield on corporate bonds relative to Treasury securities) as small and recommended the shift away from corporate bonds for 2015.
- Exposure to commodities has been reduced or eliminated by many pension funds due to the low expected returns and lack of hedging characteristics for pension liabilities.
- The investment grade debt allocation that was eliminated had low return expectations and also had duration that was too low to be valuable for interest rate hedging in a pension portfolio.
- Interest rate triggers are relatively common with pension plans, because the value of hedging interest rate risk increases as interest rates increase.
- The interest rate triggers acted to increase interest rate hedging when rates were higher (and more likely to drop) and produced good short-term results after the hedge ratio increases in both 2016 and 2018.

- Many pension fund investors have been decreasing their allocation to hedge funds because expected returns for hedge funds have decreased significantly and fees are generally higher than other asset classes.
- The increase to the Immunization Portfolio, and corresponding decrease to the Growth Portfolio, was consistent with a reassessment of the XEPP plan's liability duration and was intended to allow for further interest-rate hedging in the future if interest rates were to rise.
- The reallocation of the Immunization Portfolio toward corporate bonds realigned these assets with the target mix for the immunization portfolio.
- The shift away from emerging market equities was seen as reducing an overweight allocation to that sub-asset class due to concerns about the US dollar appreciating.

Q. IS IT REASONABLE TO ASSUME THAT THE COMPANY'S RETURN ON ITS PENSION FUND INVESTMENTS WILL MATCH THE U.S. STOCK MARKET RETURNS FOR A PARTICULAR YEAR?

A. No. The return on the pension fund will reflect the combination of returns for the asset classes that the portfolio is invested in. Equities (the stock market) will generally have the highest return expectation in any portfolio over time, but those returns are quite volatile, and in any one year, or over periods of several years, they may have very high or very low returns that are not reflective of the long-term expectation. A portfolio designed to match returns in the U.S. equity market would be considered very risky, despite having a high long-term expectation for returns. A well-designed portfolio with a balance of objectives, including seeking high return, diversification, and other risk reduction will likely, over time, and in many years, have returns lower than the U.S. equity market.

Q. What is your overall conclusion regarding the reasonableness of the Company's target asset allocations?

A. The target asset allocation for the Company's pension plan is reasonable, and the changes in the asset allocation during the period 2015 – 2020 have been consistent with the investment strategy and based on sound assessments of market conditions, reflecting views commonly held by pension plan sponsors.

Q. How has the COVID-19 pandemic impacted the Company's investment strategy?

A. My understanding is that the Company's investment strategy and approach to asset allocation has not changed. Financial markets reacted severely early in 2020 but then largely recovered and stabilized relatively quickly. As a result, I would not have expected the COVID-19 pandemic and its ripple effects to impact the Company's approach, which is based on a long-term investment time horizon.

IV. CONCLUSION

Q. Please summarize your testimony.

A. There is no single investment strategy or asset allocation that can be considered the only appropriate and reasonable approach for any particular pension plan and plan sponsor. I consider the Company's investment strategy and asset allocation to be reasonable because it reflects a reasonable and appropriate risk framework and a level of risk that is appropriate for the circumstances of the XEPP and the plan population.

In addition, the current target allocation and changes in the asset allocation for the Company's plan over the period 2015 – 2020 are reasonable as they reflect broadly held views on market conditions and common approaches to adjusting asset allocation among pension investors.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

R. Evan Inglis, FSA, CFA, EA, MAAA, FCA

Mr. Inglis is an Independent Consultant and also an Actuary with the Pension Benefit Guaranty Corporation. As a consultant and during his career he has developed and advised on investment strategies for pension plans and other retirement programs. He is an expert in assessing financial risk and managing assets relative to pension and retirement liabilities. He has over 30 years of experience working with employee benefit plan financial matters and is a frequent speaker and writer on a wide variety of pension, retirement and investment issues and ideas.

The following summarizes Mr. Inglis' career:

- Actuary with the Pension Benefit Guaranty Corporation (July 2019 to present)
- Independent Consultant for World Bank, D3P Global Pension Consulting, The Global Aging Institute and other organizations (December 2014 to present)
- Nuveen Asset Management (January 2015 to September 2018): Senior Vice President
- The Terry Group (1/2014 – 12/2014): Worked with the founders to develop business ideas and contacts and analyzed risks for a number of public pension situations.
- The Vanguard Group (2008 – 2013): Served as the chief actuary and advised pension clients on liability-driven investment strategies and served as a resource for institutional clients on pension and related issues
- Watson Wyatt (2003 – 2008): Lead actuary for General Motors account and led a multi-office team advising and supporting GM on pension and OPEB issues
- Watson Wyatt (1998 – 2003): Served as director of quality and developed and implemented a global quality program focused on efficiency, risk management, and producing high-value work for clients
- Watson Wyatt (1983 – 1998): Senior consulting actuary in Portland (Oregon), Seattle, Oslo and Stockholm

Mr. Inglis is a Fellow of the Society of Actuaries and a CFA Charterholder.

Mr. Inglis has played significant leadership roles within the actuarial profession. He served on the Society of Actuaries Board of Directors from 2012 - 2015 and currently is a member of the Public Plan subcommittee of the American Academy of Actuaries Pension Committee. He established and chaired the Continuing Education Committee for the Investment Section of the Society of Actuaries. He chaired the Pension Finance Task Force, jointly sponsored by the Society and the Academy. He has served on the Pension Practice Council of the Academy and the Pension Section Council of the Society, and has contributed to numerous other research and advocacy efforts within the profession.

Mr. Inglis has a global perspective. He worked in Norway and Sweden for Watson Wyatt, providing pension actuarial consulting services in the 1990s. He was the Global Director of Quality for Watson Wyatt, overseeing the implementation of standards of work and standard processes in the company's offices in Asia and the Americas in the 2000s. He has served as a consultant for the World Bank and other organizations assisting pension regulators in Costa Rica, India, Rwanda and Indonesia with pension actuarial, retirement income and investment issues.

Mr. Inglis is a thought leader in the pension, investment and retirement industry, writing and speaking frequently on various topics. Some of Mr. Inglis' recent contributions include:

- *A Risk-Based Framework for Making Retirement Income Decisions* (First prize in Society of Actuaries essay contest on products, tools and strategies to address retirement risks, 2020)
- *Hitting the Wall – Why Investors Can Expect Lower Returns in the Near Future, and For a Long Time to Come* (Contingencies, March/April 2019)
- *Paying the Pension: Markets, Products and Choices* (Chapter in "Saving the Next Billion from Old-Age Poverty: Global Lessons for Local Action", 2017)
- *Feel Free Retirement Spending* (First prize in Society of Actuaries essay contest on diverse retirement risks 2016; covered in USA Today, CBS MoneyWatch, Investment News)
- *A Risk-based Framework for Pension Decision-making* (Contingencies Magazine, 2013)

Articles, Essays and Book Chapters

A Risk-Based Framework for Making Retirement Income Decisions
Society of Actuaries essay contest on products, tools and strategies in retirement 2020, first prize

Hitting the Wall – Why Investors Can Expect Lower Returns in the Near Future and For a Long Time to Come
Contingencies, March/April 2019

Guaranteed Retirement Income – How Much Do You Need?
Retirement Section News, June 2019

Replacement Ratio – The Dinosaur of Retirement Planning
Retirement Section News, February 2019

Paying the Pension: Markets, Products and Choices
Chapter in "Saving the Next Billion from Old-Age Poverty: Global Lessons for Local Action", 2017

The Feel Free Approach to Retirement Spending
Society of Actuaries essay contest on diverse risks in retirement 2016, first prize

Long Bonds for the Short Run
Institutional Investor Journal of Investing, Winter 2016

Consideration for Frozen Pension Plans: Immunization or Termination?
Institutional Investor Guide to Pension and Longevity Risk Transfer, 2014

Investment Fallacy: Active Management Overall Performs Differently than Passive Management
Society of Actuaries Investment E-Book, 2014

Trading Places: A Life and Pension Actuary Find Common Ground to Express Funding Concepts
Published in various Society of Actuaries Section Newsletters, 2014

Why are Corporate Pension Plans Reducing Risk Now?
Risk & Rewards, Pension Section News, 2012-2013

A Risk-based Framework for Pension Decision-making
Contingencies Magazine, 2013

Quoted extensively in CFO Magazine article on pension risk, *The Great Pension Derisking*, 2013

Understanding Liabilities Key to Well-Designed Pension Investment Strategies
Investment & Wealth Monitor, 2010

Speech, Panel and Webcast Highlights

Setting Expected Returns
2021 Enrolled Actuaries Meeting

Products Tools and Strategies that Address Retirement Risks
2020 Society of Actuaries Annual Meeting

Retirement System Payouts
Third Webinar on Pensions, Institute of Actuaries India 2020

Risk Mitigation: Back to Basics
2019 Conference of Consulting Actuaries Annual Meeting

ALM for Public Plans
2019 Conference of Consulting Actuaries Annual Meeting

Developing Return Expectations in Today's Capital Markets – What Methods Work Now
American Academy of Actuaries Webinar, 2019

Retirement System Payouts – Policy Ideas and Issues
Caribbean Association of Pension Supervisors, 2019

Expected Return Q&As for Actuaries
2019 Enrolled Actuaries Meeting

SOA Research and its Application to Pension Actuaries
2019 Enrolled Actuaries Meeting

Rise and Fall of Discount Rates
2019 Enrolled Actuaries Meeting

What's New in the LDI Space
2018 Conference of Consulting Actuaries Annual Meeting

Speech, Panel and Webcast Highlights cont'd.

Funding in the New World
2018 Enrolled Actuaries Meeting

Expected Return Q&As for Actuaries
2018 Enrolled Actuaries Meeting

The Sustainability of Public Pensions
For various public plan trustee audiences in 2017

New Perspectives on Fixed Income for Public Plans
For various public plan investment audiences in 2017

Setting the Investment Return Assumption for Public Plans
2017 Conference of Consulting Actuaries Annual Meeting

Impact of Current Low Rates on Investment Return Assumptions
2017 Conference of Consulting Actuaries Annual Meeting

Delivering Optimum Retirement Outcomes
Saving the Next Billion from Old-Age Poverty: Global Lessons for Local Action Conference

Pension De-Risking Glidepaths: Foundations, Considerations, Implementation
2017 Society of Actuaries Webcast

Setting an Expected Return Assumption – Everything Old is New Again
2017 Society of Actuaries Annual Meeting

Glidepaths in DB and DC Plans
2016 Conference of Consulting Actuaries Annual Meeting

Feel Free Retirement Spending
2016 Society of Actuaries Annual Meeting

Using Derivatives in Pension Investment Strategies
2016 Society of Actuaries Annual Meeting

Beyond Fixed Income – Other Important Asset Classes
Society of Actuaries Investment Bootcamp, 2016

Getting Creative with DC Plans
2016 Enrolled Actuaries Meeting

Public Pension Risk Management
2016 Enrolled Actuaries Meeting

Speech, Panel and Webcast Highlights cont'd.

Public Plan Investing – Is There Another Way?
2016 Society of Actuaries Investment Symposium

Ethics in a Pension Context
2015 Society of Actuaries Annual Meeting

Are Financial Economics Principles Applicable to Public Pension Plans
2015 Society of Actuaries Annual Meeting

Communicating Risk
2015 Enrolled Actuaries Meeting General Session

Potpourri of Investment Topics (Demographic-based Investing)
2015 Enrolled Actuaries Meeting

Public vs. Private Pension Risk Management
2015 Society of Actuaries Investment Symposium

Public Pension Plans: Great Crisis, Small Crisis, or No Problem
2014 Society of Actuaries Meeting

Asset Management to and through Group Annuity Purchase
2014 Society of Actuaries Meeting

Pension Management from a Risk Management Perspective
2014 Society of Actuaries Meeting

Finding Common Ground – Financial Economists and Actuaries Look at Public Pension Plans
2014 Conference of Consulting Actuaries Meeting

Stochastic Modeling
2014 Enrolled Actuaries Meeting

Derisking Investment Strategies in a Low Interest Environment
2014 Enrolled Actuaries Meeting

LDI Challenges
2014 Society of Actuaries Investment Symposium
2014 Mid-Atlantic Actuarial Club Annual Meeting

Pension Risk Transfer & Investment Strategies
2013 Society of Actuaries Annual Meeting

Discount Rates for Pension Plans
Society of Actuaries webcast, 2013

Speech, Panel and Webcast Highlights cont'd.

Risk-Sharing Plan Designs - A Look at Variable Annuity Plans and Other Emerging Pension Plan Designs
Society of Actuaries Annual Meeting, 2013

Who's Managing the Risk Anyway? Perspectives on Risk, Risk Management and the Actuarial Profession
2013 Philadelphia Actuarial Club Annual Meeting

Intergenerational Equity: Who will Pay for Past Promises
Society of Actuaries Annual Meeting, 2013

LDI: Where We've Been, Where We Are and Where We're Going
Conference of Consulting Actuaries webcast, 2013

Measuring the Success of Hedging Portfolios
2013 Society of Actuaries Investment Symposium,
2012 Pensions & Investments Liability Driven Investing Conference

Pension Risk Transfer, Analysis of 2012 Derisking by GM from Corporate Finance Perspective
Society of Actuaries webcast, Michigan Actuarial Society annual meeting

Derisking is Job One: A Review of Ford and GM's Pension De-Risking Efforts and the Impact on Plan Sponsors
Society of Actuaries webcast, 2012

PBGC Risk-based premiums
2012 Society of Actuaries Meeting

Dynamic Asset Allocation
2012 Enrolled Actuaries Meeting

Derisking Pension Plans
2012 Enrolled Actuaries Meeting

Unique Issues for Hybrid Plans
2011 Society of Actuaries Annual Meeting

Pension Derisking: Start with the End in Mind
2011 Pensions & Investments Liability Driven Investing Conference

Green DB: Making Pension Plans Sustainable
2010 ACOPA Advanced Actuarial Conference
2010 Pensions & Investments Liability Driven Investing Conference

Plan Design for the Future
2010 Enrolled Actuaries Meeting

Assumption Setting for Retirement Plans: Market-based vs. Best Estimate
2010 Society of Actuaries Annual Meeting

Pension Investment Strategies for the 21st Century
2010 Enrolled Actuaries Meeting General Session

Research Highlights

Variable Uninsured Life (VALUE) Annuities: Theory, Practice and Country Cases (draft, Society of Actuaries, 2021)

Asian Provident Funds: Meeting Tomorrow's Challenges, Coauthor with Richard Jackson (World Bank Group, 2021)

Risk Sentiment: Equity Risk Premiums, Return Forecasting and Capital Markets Modeling (Working Paper, 2019)

Demographic-based Asset Allocation for Public Pension Plans (Nuveen Asset Management, 2017)

How Old is Your Pension Plan? Matching Pension Investing to Plan Demographics (Nuveen Asset Management, 2017)

Pension plan immunization strategies: How close can you get? (Vanguard, 2013)

Frozen pension plans: Is immunization or termination the right choice? (Vanguard, 2012)

Pension Derisking: Start with the end in mind (Vanguard, 2012)

For better pension liability matching, consider adding Treasuries (Vanguard, 2012)

Pension plan termination: Minimizing cost and risk (Vanguard, 2011)

Investment strategies for cash balance plans--more risk than you thought (Vanguard, 2011)

Expert Witness and Public Testimony

Testified before the Minnesota State Public Utilities Commission in the Matter of the Application of Northern States Power Company for Authority to Increase Rates for Electric Service in Minnesota, 2016, 2020

Testified on corporate view of pension risk transfer at DOL ERISA Advisory Committee hearings, 2013

Testified on behalf of American Academy of Actuaries to Government Accounting Standards Board, 2010 Preliminary Views on Pension Accounting and Financial Reporting for Employers

Other

Member of Civil Service Retirement System Board of Actuaries, 2016 -

Consultant to World Bank
- Co-author of Asian Provident Funds: Meeting Tomorrow Challenges with Richard Jackson at the Global Aging Institute, 2020
- Hired to advise Vietnam Social Security (VSS) on Asset-Liability Management, 2019-2020
- Hired to advise the Financial Services Authority of Indonesia (OJK), 2017
- Hired to advise India's pension regulator, Pension Fund Regulatory and Development Authority, 2016
- Hired to support training and guidance on new regulations for Costa Rica's pension supervisory body, SUPEN, 2015

Consultant to PINBox – hired to advise Rwandan government on investment and retirement income issues for national Long-Term Savings Scheme (LTSS)

Chairperson of Pension Finance Task Force (jointly sponsored by the Society of Actuaries and the American Academy of Actuaries), 2009 - 2012

Society of Actuaries Initiatives and Projects
- Chair of Retirement Investment and Assets Working Group, 2021
- Member of Professional Development Committee, 2017- 2018
- Chair of Society of Actuaries Investment Section Continuing Education Committee, 2016-2017
- Chair of Project Oversight Group for Longevity Pooling Research, 2016-2017
- Program Chair for 2016 Investment Symposium
- SOA Policy Committee Chair, 2015
- Board partner for research initiatives, 2015
- Board liaison to Investment Section Council, 2013-2015
- Longevity pooling research, chair of project oversight group 2014-2015
- Investment Bootcamp for pension actuaries, 2013
- Investment Section Council, board partner 2012 - 2014
- Seminar on plan terminations, 2011 Annual Meeting
- Pension Section Council, elected member 2008 - 2010
- Retirement 20/20, 2006 - 2010
- Non-mortality decrement task force, 2002 - 2003

American Academy of Actuaries Initiatives and Issue Briefs
- Asset Allocation and the Investment Return Assumption: Don't Put the Cart Before the Horse, 2020
- Public Interest Committee's sustainability initiative, 2014
- Measuring Pension Obligations, 2013
- Retirement for the AGES, 2012 - 2013

- The 80% Funded Standard Myth, 2012

Enrolled Actuaries Meeting Pension Symposiums

- 2014, Retirement in the U.S. – Where Are We Headed? - panels on efficiency, alignment
- 2011, Retirement Security – A Call to Action, panel on retirement income

XEPP Targets

	2020	2019	2018	2017	2016	2015
Equities						
US Equity - Large Cap	20.0 %	15.5 %	15.0 %	18.0 %	16.0 %	14.0 %
US Equity - Small Cap	2.0	3.0	5.0	3.0	4.0	4.0
Non-US Equity -	10.0	9.0	8.5	10.0	15.0	14.0
Non-US Equity - EM	6.5	9.0	9.5	9.0	6.0	7.0
Total Equities	38.5	36.5	38.0	40.0	41.0	39.0
Fixed Income						
Core					2.0	2.0
High Yield	5.0	8.5	11.0	9.0	6.0	6.0
EM Debt	9.0	9.5	9.5	7.5	6.0	6.0
Private Credit	3.0					
Total Fixed Income	17.0	18.0	20.5	16.5	14.0	14.0
Alternatives						
Fund of Hedge Fund	3.5	3.5	4.0	7.5	7.0	7.0
Private Equity	5.5	5.0	5.0	5.0	5.0	5.0
Real Estate	5.5	7.0	7.5	6.0	6.0	6.0
Commodities					2.0	4.0
Total Alternatives	14.5	15.5	16.5	18.5	20.0	22.0
Total Growth Portfolio	70.0	70.0	75.0	75.0	75.0	75.0
Immunization Portfolio plus Liquidity Portfolio	30.0	30.0	25.0	25.0	25.0	25.0
Total Portfolio	100.0	100.0	100.0	100.0	100.0	100.0