

CAS Exam Committee Presents:

CAS EXAMINATION PROCESS

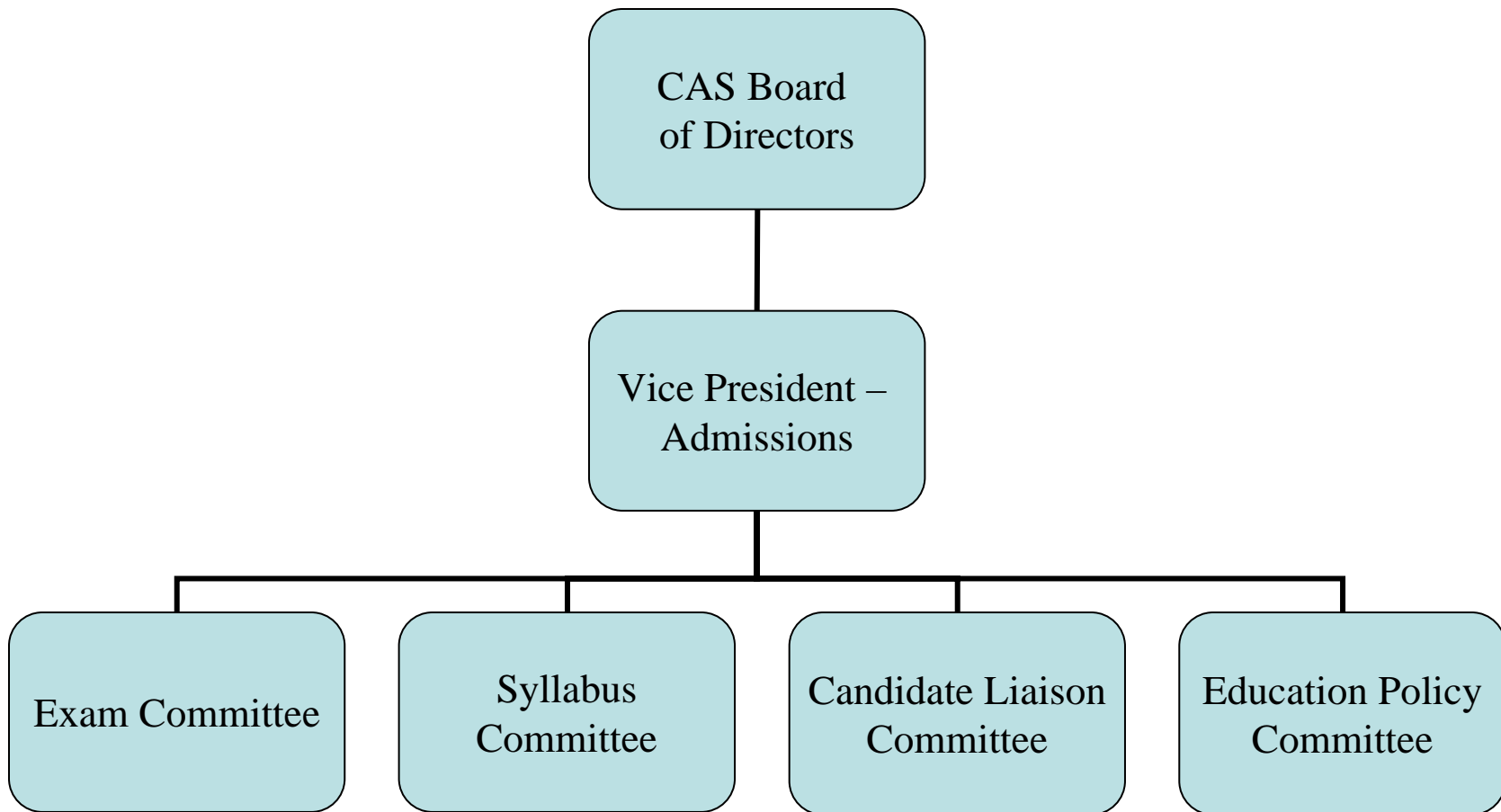
**Chris Olsen
Daniel Roth
Rajesh Sahasrabuddhe
William Wilder**

2009 CAS Annual Meeting
Boston, MA

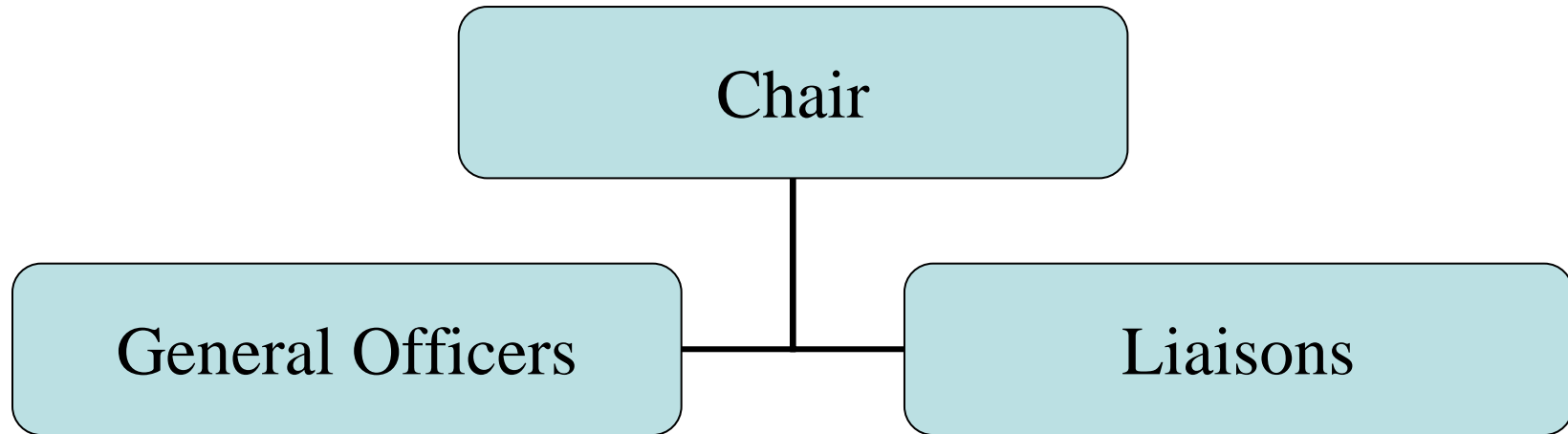
Agenda

- CAS Admissions Overview
- The Syllabus – it all starts here
- The Prelims – CAS/SOA joint exams
- The Finals – Associateship and Fellowship exams
- Post-Fellowship – Volunteering

CAS Admissions



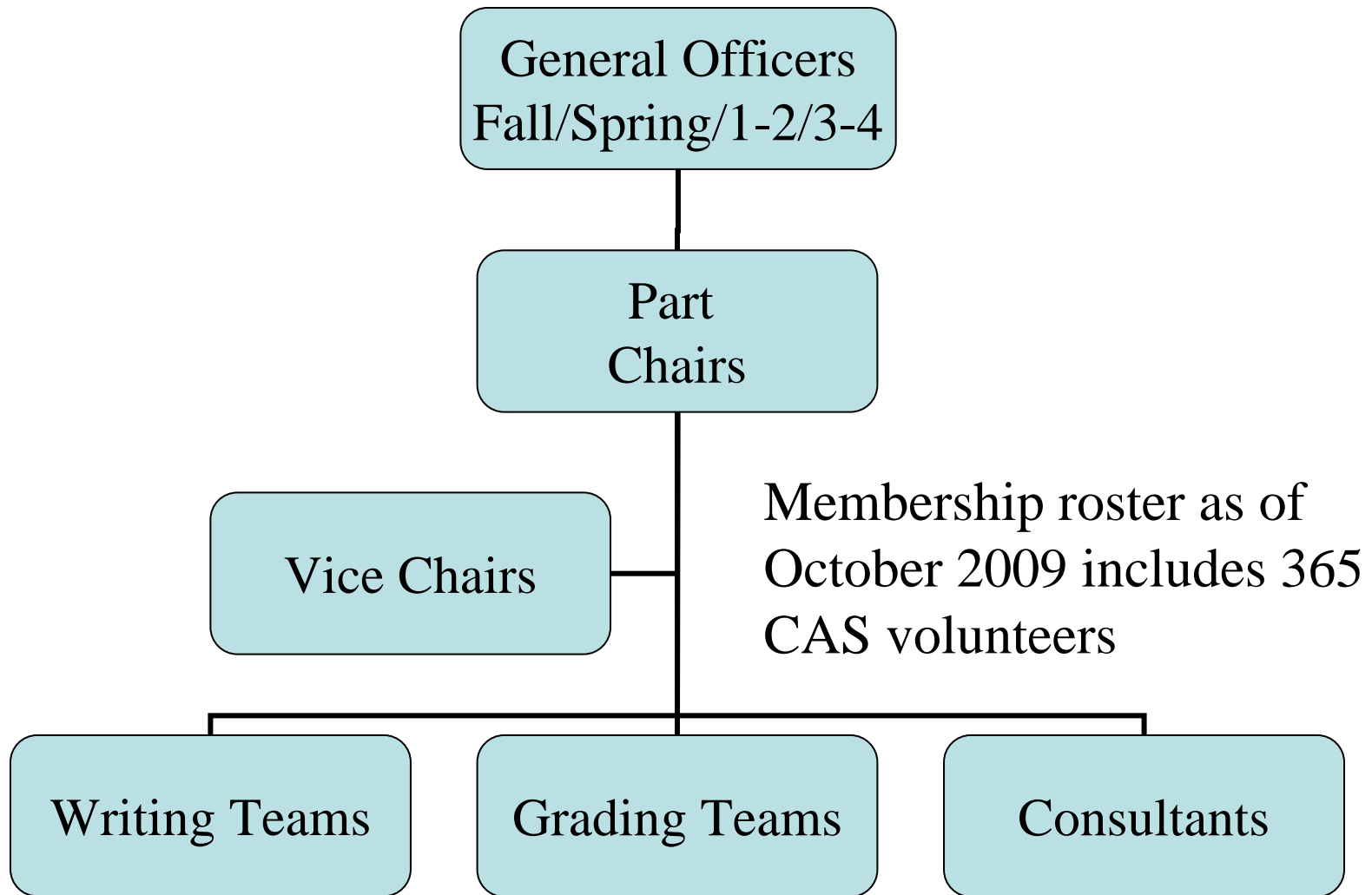
Exam Committee



- Administration
- Recruiting
- Joint Exams 1-2
- Joint Exams 3-4
- Spring Exams
- Fall Exams
- Grading Sessions
- Computer Based Testing

- Syllabus Committee
- Candidate Liaison Committee
- Canadian Institute of Actuaries
- Society of Actuaries

Exams



Committee Structure – Roles

(rather abbreviated)

- CAS Board of Directors
Provides guidance, direction, policy
- VP – Admissions
Budget management, pass mark approval,
final arbiter of disputes
- Exam Committee Chair
Manages day-to-day activities of
committee, communications, appeals

Committee Structure – Roles

(rather abbreviated)

- **General Officer**
Senior member responsible for group of exams or committee process
- **Part Chair**
Senior member responsible for construction and grading of one exam part
- **Vice Chair**
Senior member responsible for assisting the Part Chair, manages grading program for CAS 5-9

Committee Structure – Roles

(rather abbreviated)

- Consultant
Seasoned member responsible for final review of exam draft
- Writer
Member responsible for constructing individual questions
- Grader
Member responsible for scoring individual test papers

Syllabus Committee

Mission and Organization

- Mission
 - The Syllabus Committee determines the **scope and content of the syllabus** (learning objectives and knowledge statements) and **course of readings** for the CAS Examinations.
 - The committee also **directs the preparation of educational material** for the *CAS Syllabus of Basic Education*.
- Syllabus Committee
 - Chairperson – Serves three one-year terms
 - Vice Chairperson – Traditionally appointed in the final year of Chairperson's term and succeeds Chairperson the following term.
 - Senior Part Specialist – responsible for development and execution of the *Review Plan* for a specific exam
 - Part Specialists – assist the Senior Part Specialist
- Syllabus Committee Collaborators
 - Vice President – Admissions (Liaison): *Conduit to/from leadership*
 - Executive Council: *delegated authority by Board of Directors*
 - Examination Committee (Liaison) – CAS Staff Liaison
 - Editorial Committee – Candidate Liaison Committee
 - **Education Policy Committee** – Preliminary Education Committee

Syllabus Committee

Review and Production Cycle

- Typical Review Cycle (2011 is not typical)
 - Late October 2009 – Early December 2009: Meeting to discuss *Review Plans* submitted by Senior Part Specialists
 - Spring 2010 – Updates on *Review Plans*; Approval of items available for voting
 - June 2010 – Voting meeting to finalize 2011 Syllabus -> Sent to EC for Approval
 - July 2010 – September 2010 – *CAS Syllabus of Basic Education* is finalized
 - October 2010 – *CAS Syllabus of Basic Education* provided to Web Department
 - November 2010 – *CAS Syllabus of Basic Education* posted to CAS website
- Review Cycle is intended to provide continual review and improvement with respect to scope and content of the syllabus and course of readings
 - Edition updates
 - New papers (Domestic and International)
 - New research (e.g., ERM, GLM)
 - Current Events (e.g., IFRS)

Syllabus Committee Recent Significant Developments and Considerations

- 2011 Syllabus Overhaul
 - Old
Five 4-hour exams
 - New
Two 4-hour exams
Three 3-hour exams
Two internet modules (tested at familiarity level)
 - Addition of Advanced Reserving Material
 - Eliminate Financial Economics Overlap
 - Consistent with the natural linkage of basic ratemaking and basic reserving (New Exam 5)
- Coordination with CERA Goals
- Computer-Based testing
- Commissioned Study Materials
 - “Basic Ratemaking” (*Werner, Modlin*)
 - “Estimating Unpaid Claims Using Basic Techniques” (*Friedland*)
- Multiples texts
- Other initiatives considered:
 - Capstone Seminar
 - Pre-Fellowship tracks

Joint Examination Overview

- Exams 1/P, 2/FM and 4/C are now offered by computer, more than twice a year.
- Exams MLC, 3L and 3F/MFE are still written twice a year.
- Exams 1/P and 2/FM now give candidates preliminary results when they finish the exam.

Committee Functions: Exams 1-4

1. Item Writing

- Creation cycle varies by exam.
- Each committee member writes 5 to 6 questions on assigned learning objectives.
- Exclusive use of multiple choice questions
- Detailed solutions to facilitate use in computer based testing environment
- Peer review – all committee members solve and verify accuracy of each question and solution.

Committee Functions: Exams 1-2

2. Exam Construction

- For exams 1 & 2, an algorithm selects a unique exam for each candidate, that is balanced for Syllabus coverage and difficulty.
- New items are created continuously and used to replace older questions.
- New exam questions are then pre-tested in the computer based environment.
 - These questions do not count towards a students exam score.
 - Each student receives the same number of pre-test questions.

Committee Functions: Exams 3L-3F

2. Exam Construction

- For exams 3 & 4, all committee members, part chair and vice chair, and some consultants review all items and model solutions to select questions.
- Best items selected are then edited as necessary for clarity, style and convention by committee members.
- Two rounds of full exam review including part chair and vice chair plus:
 - Round 1: First part chair, vice chair and consultants
 - Round 2: Second SOA examination committee chair, general officers from SOA and CAS, part chair, vice chair and proof reader

Committee Functions: Exams 1-4

3. Setting the Pass Mark

- Part committee members estimate how many points the *Minimally Qualified Candidate (MQC)* will score on each item.
- The total of the item-by-item *MQC* point estimates forms an *a priori* pass mark that will be the starting point for pass mark discussion panel.
- Final pass mark is set by SOA examination committee chair, SOA & CAS general officers, part chair, vice chair. This is approved by the boards of the CAS, SOA, and CIA.
- For computer based exams the pass mark is a function of the difficulty of the specific questions asked. This sets a unique pass mark for each exam and allows for instantaneous results.
- Not in Vegas every meeting, but still pretty good locations 16

Committee Functions: Exams 5-9

Process Overview

The Exam Committee's production cycle for Exams 5-9 takes about one year and includes the following stages:

1. Item Writing
2. Exam Construction
3. Pass Mark Panel
4. Grading
5. Appeals

Committee Functions: Exams 5-9

1. Item Writing

- Mandatory one-day item writer training with hands-on practice and specific feedback
- Focus on requiring demonstration of *Learning Objectives*
- Exclusive use of constructed response items (i.e., “problem and essay questions”)
- Encourage open ended items inclined toward synthesis rather than reiteration
- Detailed partial credit grading rubrics
- Peer review

Committee Functions: Exams 5-9

2. Exam Construction

- Small group of experienced part committee members, part chair and vice chair reviews all items, model solutions and grading rubrics
- Best items selected with additional edits as necessary for clarity, style and convention
- Target long-term *Learning Objective* mix as documented in Syllabus
- Two rounds of full exam review including part chair and vice chair plus:
 - Round 1: First consultant and general officer
 - Round 2: Second consultant, general officer, Exam Committee chair and proof reader

Committee Functions: Exams 5-9

3. Pass Mark Panel

- Small team of experienced part committee members, part chair, vice chair and general officers
- Estimate how many points the *Minimally Qualified Candidate (MQC)* will score on each item
 - The *MQC* is the hypothetical candidate who has mastered the *Learning Objectives* barely well enough to pass the exam.
 - The “MQC Document”, which is maintained independent from the exam itself, details what the *MQC* will demonstrate under test conditions.
 - This document essentially defines the lowest level of performance that is required to pass.
- The total of the item-by-item *MQC* point estimates forms an *a priori* pass mark that will be the starting point for pass mark setting at the grading session.

Committee Functions: Exams 5-9

4. Grading

- Each answer sheet is scored by two graders.
- Generally each grader is assigned to two items, but with candidate counts up, some parts now assign only one item per grading pair.
- Much grading is done prior to the session (in LAS VEGAS!). Grades are entered into standard Excel template and hand validated at the beginning of the grading session.
- Grading pairs must reconcile to within a narrow tolerance for every answer sheet. Answer sheets for candidates within several points of the pass mark are fully re-graded and reconciled.
- Graders provide item-by-item *ex post* estimates of *MQC* performance for the items they grade. These are considered along with the Pass Mark Panel's *a priori* estimates when setting the final pass mark.

Committee Functions: Exams 5-9

5. Appeals

- Each appeal is evaluated first by the CAS office staff to eliminate invalid appeals, e.g. requests for re-grading.
- Valid appeals are forwarded to the part chair and vice chair, who then cascade to grading pair for feedback.
- Part chair responds directly to the chair with recommendations as well as impact on any change in scoring for the candidates.
- Exam Committee chair provides final formal response to candidates, which is delivered by the CAS office.
- Appeals resulting in a change in score from Fail to Pass are uncommon.

Join In – Volunteer

- More volunteers WILL be needed over the next few years, both writers and graders
- Exam Committee work counts toward your Continuing Education requirements¹
- LAS VEGAS
- Sign up via:
 - participation survey
 - direct contact to CAS
 - e-mail to Chair

¹Applicability of material to category of CE and common sense guidelines apply to the recording of CE credits. See AAA publication for additional information.

Future Changes

- Syllabus improvements
- 2011 system redesign
- Increased use of computers in testing
- Additional exam sittings
- More candidates for upper exams

Questions?