16. (4 points)

A company experiences an annual level of low-severity losses totaling $500,000 and periodic loss events as shown in the table below:

Period of Occurrence	Descriptor	Loss Amount
Once every Five years	Additional Low Severity Losses	$2,000,000
Once every Three years	Single Large Loss	$1,000,000

All loss events are independent of each other.

a. (1.25 points)

The company and their insurer agree on a Large Dollar Deductible (LDD) policy with the following characteristics:

- minimizes effect of a single large loss
- guarantees reimbursable loss will not exceed $2,000,000
- results in expected annual reimbursable loss of $1,000,000

Design an LDD plan that meets the goals of the company. Note that the expected losses can be expressed as a function of the aggregate maximum and the per occurrence limit.

b. (1.75 points)

Construct a Lee diagram showing the effect of the designed LDD plan structure on the loss profile of the company.

c. (1 point)

The company is also considering a retrospective policy with the following characteristics:

- no per-occurrence limit
- same maximum entry ratio as in the LDD plan above

Assume the single large loss had an expected value of $500,000 instead of $1,000,000. Describe the change to the Table M charge for the retrospective plan compared to the charge described in the LDD plan in a. above.

CONTINUED ON NEXT PAGE

QUESTION 16

TOTAL POINT VALUE: 4 **LEARNING OBJECTIVE: B5, B6**

SAMPLE ANSWERS

Part a: 1.25 points

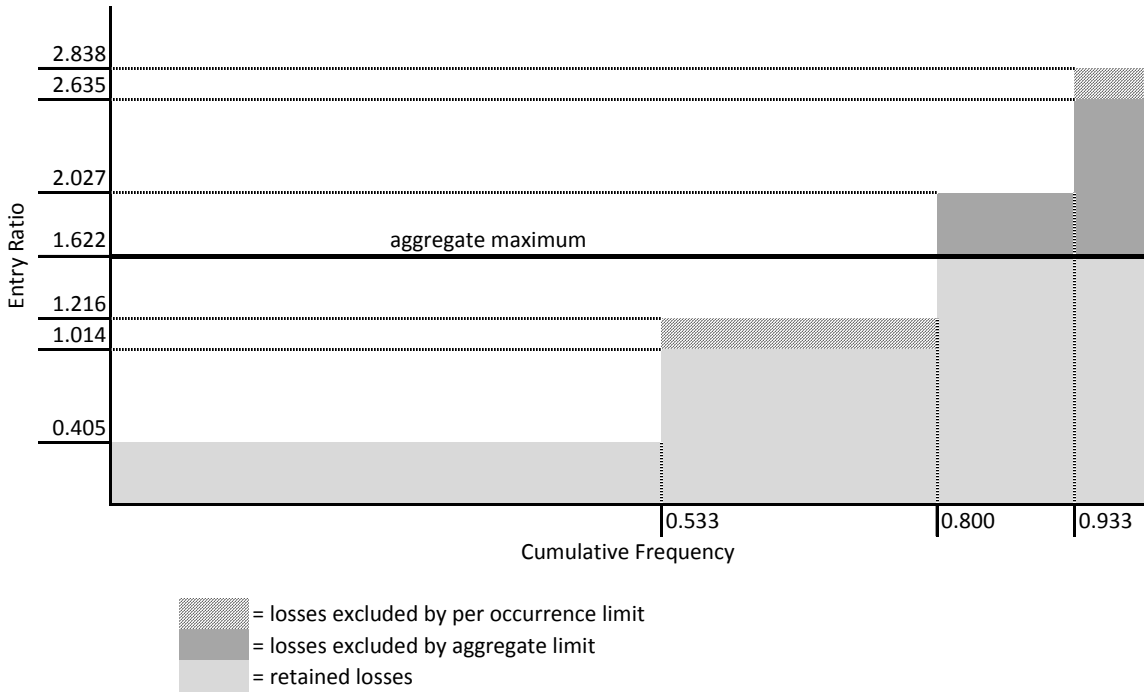
Agg Limit = $2M
Occurrence Limit = X

prob	unlimited	limited
0.533	500,000	500,000
0.267	1,500,000	X + 500,000
0.133	2,500,000	2,000,000
0.067	3,500,000	2,000,000

$$(0.533)(500{,}000) + (0.267)(X + 500{,}000) + (0.2)(2{,}000{,}000) = 1{,}000{,}000$$

Occurrence Limit = $750K

Part b: 1.75 points



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Part c: 1 point

For the retro policy, the decrease in the large loss will decrease the volatility of the entry ratio distribution resulting in a smaller charge. For the LDD policy, the distribution is less volatile due to the occurrence limit, so a decrease in the large loss will be less impactful.

EXAMINER'S REPORT

General Commentary

This was a very challenging question for many reasons (synthesis across multiple papers, question has not been asked before, long question with many details) with no candidate receiving full credit and many not attempting any answer.

Part a

- Candidates were expected to understand how aggregate limits and occurrence limits impact unlimited losses.
- In order to receive full credit, candidates needed to determine the aggregate limit and occurrence limit that combine to yield the three LDD characteristics given in the question.
- While most candidates who attempted to answer this part gave the correct aggregate limit, very few were able to determine the correct occurrence limit.

Part b

- Candidates were expected to draw an accurate Lee diagram consistent with part a.
- In order to receive full credit, candidates needed to draw a Lee diagram that was either correct or consistent with their answer in part a, including labeled axes and clear identification of the impact of the aggregate and occurrence limits.
- Less than one-quarter of the candidates were able to produce a Lee diagram that was consistent with part a.

Part c

- Candidates were expected to understand how a change in the tail/volatility of the unlimited distribution would impact the charge for a retro policy compared to an LDD policy.
- In order to receive full credit, candidates needed to note that both charges would decrease, but the retro charge would decrease more than the LDD charge.

- Nearly half the candidates left this part blank.
- Of those that answered, more than half received no credit, with very few full credit responses.