Subtitle C and D Corporate Financial Test Analysis
Issue Paper
Assessment of Financial Assurance Risk of Subtitles C and D Corporate Financial Test and Third-Party Financial Assurance Mechanisms

Introduction

This paper analyzes situations where the Agency might become responsible for paying closure and post closure care costs at a facility. Specific issues related to this include:

- The assurance risk of the Subtitles C and D financial test;
- The failure rate of third-party financial assurance mechanisms; and
- The Agency's criteria for evaluating alternative Subtitle C and D financial tests.

The use of both financial tests and third-party mechanisms for financial assurance always carries some limited amount of financial risk for the public. In utilizing a financial test it is not possible to minimize both public costs (costs to the public of paying for unfunded obligations of bankrupt firms) and private costs (costs to viable firms of obtaining financial assurance mechanisms). This issue paper analyzes the relative risk posed to the public by the Subtitle C and D financial test and third-party mechanisms.[1] The key findings of this analysis are as follows:

- Estimated financial assurance risk for the proposed Subtitle C and D financial test ranges from 0.233 percent for firms in the largest net worth category to 1.067 percent for firms in the smallest net worth category.
- The estimated financial assurance risk for third-party mechanisms ranges from a low of 0.001 percent (insurance) to a high of .050 percent (letter of credit, SAIF/FSLIC).
- The Agency's criteria for evaluating alternative financial tests is consistent with its decision to allow third-party financial assurance mechanisms in addition to trust funds. Despite some variation in assurance risks, the Agency concluded that all of these mechanisms provide acceptable, and substantially equivalent degrees of financial assurance.

This paper is organized into three sections. Section 1 examines the assurance risk of the proposed Subtitle C and D financial test. Section 2 looks at the approved third-party mechanisms and their corresponding levels of assurance risk. Section 3 examines the Agency's criteria in assessing the best policy for Subtitle C and D financial assurance regulation.

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[1] Analysis of assurance risks for different financial assurance mechanisms taken from manuscript prepared for U.S. Nuclear Regulatory Commission Office of Nuclear Regulatory Research. Analysis of Assurance Provided by Current and Proposed Financial Assurance Mechanisms, ICF Incorporated, November, 1992.

1. Assurance Risk of Subtitle C and D Financial Test

The financial test analysis is based on failure risk because the objective of the financial test is to pass firms that are able to meet their financial assurance obligations, and to fail firms that are more likely to enter bankruptcy without the means to meet those obligations. The true risk of concern to the Agency is assurance risk (i.e. the risk that the Agency will become responsible for an owner's or operator's obligations). The assurance risk for EPA's proposed financial test is the product of the failure rate for all firms and the misprediction of the financial test. That is:

(Failure Rate For All Firms) * (Misprediction Rate For Bankrupt Firms) = Assurance Risk For All Firms

Exhibit 1 presents the estimated failure rates and assurance risk rates (by net worth categories) for both the Subtitle C and D financial tests.

Exhibit 1: Failure Rates and Assurance Risks By Net Worth Categories

Net Worth ($ million)	A Failure Rate (%)	B Bankrupt Firm Misprediction Rate	A X B Subtitle C & D Assurance Risk
1 - 10	1.6	0.667	1.067
10 - 20	1.5	0.429	0.644
20 - 100	1.1	0.300	0.330
100 +	0.7	0.333	0.233

In its financial test analysis, the Agency evaluated a variety of financial measures to determine which ones discriminate best between viable and bankrupt firms, and thereby minimize assurance risk. Through this process, a variety of measures, including net worth were identified. The analysis found that larger firms with higher net worth failed less frequently than firms with lower net worth. Exhibit 1 clearly illustrates this point. Assurance risk decreases steadily across both tests as net worth increases.

The average misprediction rates for the Subtitle C and D tests ranged from 33 to 67 percent, depending on the net worth category (that is, between 33 and 67 percent of bankrupt firms' obligations could have been covered by the financial test during at least one of the three years prior to bankruptcy). Because bankruptcy is a relatively rare occurrence, the overall assurance risk of the financial test is therefore between .233 and 1.067 percent (i.e., the misprediction rate times the overall failure rate).

Net worth is not, however, the sole factor used in the financial test to assess a firm's financial strength. The proposed test's ratio and bond rating alternatives are also key factors in determining the test's availability to any single firm. The ratio and bond rating alternatives coupled with the net worth requirement make the proposed test more difficult for firms to pass. That is, they reduce the availability of the test. This reduction in availability increases the cost to the private sector because it forces firms to obtain third-party assurance mechanisms.

However, the financial ratio and bond rating required also decrease the misprediction rate of the proposed test, which reduces the assurance risk to the Agency. This trade-off between availability and misprediction is discussed further in Section 3.

2. Assurance Risk of Third-Party Mechanisms

Although there is some assurance risk associated with the proposed Subtitle C and D financial tests, there is also assurance risk associated with other financial assurance mechanisms. This section provides an evaluation of the estimated assurance risk of the following financial assurance mechanisms: trust funds, surety bonds, letters of credit, and insurance.

Trust Fund

A trust fund that is fully funded in advance provides an effective source of assurance that invested funds are well protected from the bankruptcy of a principal (e.g., a firm owning MSWLFs) or grantor. When a trust fund is established the grantor transfers legal title to the property deposited in the trust fund to the trustee. Thus, a properly drafted trust fund should not be vulnerable to creditors of a bankrupt operator. A trust fund may, however, be vulnerable to bankruptcy of the financial institution serving as trustee. Section 258.74 (a) of 40 CFR states: "The trustee must be an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency." Limiting acceptable trustees to such entities minimizes the risk of bankruptcy of the trustee. The assurance risk posed to the Agency is therefore negligible.

The investment risk of a trust fund depends on whether funds are invested in low risk investments (e.g., Treasury Bills), or moderate to high risk investments (e.g., stocks, futures, and stock or commodity options). The assurance risk of a trust fund invested with a low risk investment policy is negligible. A low risk investment policy virtually assures that at least 100 percent of the invested funds will be available for use when needed. The moderate to high risk investment policy poses some degree of assurance risk. Such a policy does not guarantee 100 percent of funds will be available due to the riskier nature of its investment options. Exhibit 2 illustrates the comparative risk of a pre-paid trust fund under both investment policies. The assurance risk posed by the trust fund is the product of the failure rate of firms (by net worth category) and the probability that less than 100 percent of funds will be available when needed.[2]

[2] Calculations based on Stocks, Bonds, Bills, and Inflation: 1991 Yearbook Market Results for 1926 - 1990, Ibbotson Associates, 1991.

Exhibit 2: Assurance Risk of Trust Fund Utilizing Different Investment Policies		
	Assurance Risk (%)	
Net Worth ($ million)	Low Risk Investment Policy	Higher Risk Investment Policy
10 - 20	0.0	0.047
20 - 100	0.0	0.039
100 - 400	0.0	0.031
400 - 1 billion	0.0	0.021
> 1 billion	0.0	0.005

The assurance risk of trust funds with a low risk investment policy is 0 percent. There is virtually no risk to the public. A higher risk investment policy increases assurance risk, but not dramatically. Because firm failure rates decline with net worth, assurance risk declines as net worth increases.

It is important to note that the above evaluation of trust funds assumes that sufficient funds are set aside to cover closure/post-closure care costs at the time the trust is initially set up. Subtitle C and D regulations do not require firms to fully fund their trusts in advance; firms may fund them through annual payments over a finite period of time (the pay-in period). It is possible that firms using this type of gradually funded trust could go bankrupt without having sufficient funds to cover closure/post-closure care costs. The assurance risk of trusts with pay-in periods is, therefore, somewhat greater than the assurance risk cited above. Once the pay-in period is complete, however, the assurance risk becomes equal to that cited for a fully-funded trust.

Surety Bonds

The effectiveness of surety bonds depends on the continued financial health of the surety company. Existing state regulations help to ensure that surety companies have the financial strength to meet their obligations. In addition, EPA accepts only surety bonds issued by companies listed on Treasury Circular 570, "Surety Companies Acceptable on Federal Bonds." To be on this list, sureties must comply with standards established by the Treasury Department (as specified in Sections 9304 and 9308 of Title 31 of the United States Code).

Surety bonds provide assurance of funds in the event of bankruptcy of a principal (i.e., the owner or operator). Because the surety bond is an obligation of a third party, the surety company, and not an obligation of the principal, funds assured by the bond are not subject to the claims of the owner or operator's creditors in a bankruptcy proceeding. If the surety company must make a payment or perform an act on behalf of a bankrupt company, the surety company must attempt to recover the funds through the bankruptcy proceedings.

A surety bond mechanism therefore provides a source of financial assurance that is completely independent from the regulated Subtitle C or D firm demonstrating financial assurance, and assurance risk is limited to those instances when a regulated firm goes bankrupt and its surety bond provider becomes insolvent. The assurance risk for EPA's surety bond mechanism is a function of the assurance risk for all firms and the failure rate for Circular 570 firms. Data compiled by the Surety Bond Branch of the Treasury Department indicates that over the period 1984 through 1990, Circular 570 listed 316 surety firms, on average, each year. Over this period, 125 firms were terminated (removed from Circular 570). Of these terminated firms, 21 were subsequently liquidated between 1984 and 1990 (all of them within three years of termination). Therefore, the average annual number of failures for Circular 570 surety firms was 3 (21 failures divided by 7 years). The average annual failure rate for Circular 570 firms was 0.95 percent (3 failures per year divided by 316 Circular 570 firms equals 0.0095). The assurance risk of the surety bond mechanism is therefore 0.95 percent of the assurance risk associated with having no financial assurance mechanism (0.0095 times the estimated failure rate for each net worth category). Exhibit 3 shows that this assurance risk is extremely low for firms in any net worth category.

Exhibit 3: Estimated Assurance Risk of Surety Bonds by Net Worth Categories

Net Worth ($ million)	Failure Rate (%)	Assurance Risk (%)
1 -10	1.6	0.015
10 - 20	1.5	0.014
20 - 100	1.1	0.010
100 +	0.7	0.007

The overall level of assurance risk facing the Agency is quite small, and diminishes as the net worth of the firms increases.

Letters of Credit

Letters of credit provided by banks or savings and loans (S&Ls) also provide a completely independent source of financial assurance. The assurance risk of this mechanism is limited to those instances when a regulated firm fails to honor its obligations, and the bank or S&L issuing the standby letter of credit also becomes insolvent. Although bank and S&L deposits are covered by federal deposit insurance, the courts have explicitly ruled that this coverage does not extend to standby letters of credit.

Data provided by the Federal Deposit Insurance Corporation (FDIC) indicate that FDIC-regulated banks numbered 13,574, on average, during the seven years from 1984 through 1990. Over this period, there were 1,082 FDIC bank failures. Therefore, the average annual number of FDIC bank failures was 155 (1,082 failures divided by 7 years), and the average annual failure rate for FDIC-insured banks was 1.14 percent (155 average annual failures divided by 13,574 FDIC-regulated banks equals 0.0114). Thus, the assurance risk of a

standby letter of credit from an FDIC-insured bank is only 1.14 percent of the assurance risk associated with having no financial assurance mechanism (1.14 times the estimated failure rate for each net worth category). Exhibit 4 shows that this assurance risk is extremely low for firms in any net worth category.

Exhibit 4: Assurance Risk of Standby Letters of Credit for FDIC Insured Banks By Net Worth Category

Net Worth ($ million)	Failure Rate (%)	Assurance Risk (%)
1 -10	1.6	0.018
10 - 20	1.5	0.017
20 - 100	1.1	0.013
100 +	0.7	0.008

It should be noted that the assurance risks shown in Exhibit 3 are based on a seven-year period of exceptional turmoil in the banking industry. Throughout the 1950s, 1960s, and 1970s, the FDIC insured approximately the same number of banks as in the 1980s, but the average annual number of bank failures in previous decades was less than one-tenth of that recorded in the 1980s. Even given this period of exceptional turmoil the overall level of assurance risk varied from a high of only 0.018 percent to a low of 0.008 percent. Assurance risk diminished as the net worth of firms increased.

Data provided by the Office of Thrift Supervision and the Resolution Trust Corporation indicate that thrifts insured by the Savings Association Insurance Fund (SAIF) and its predecessor, the Federal Savings and Loan Insurance Corporation (FSLIC), numbered 3,014, on average, during the seven years from 1984 through 1990. Over this period, there were 721 SAIF/FSLIC thrift failures. The average annual number of failures was 103 (721 failures divided by 7 years), and the average annual failure rate for SAIF/FSLIC thrifts was 3.42 percent (103 average annual number of failures divided by 3,014 S&Ls equals 0.0342). Thus, the assurance risk of a standby letter of credit from an SAIF/FSLIC thrift (over this seven year period) was 3.42 percent of the assurance risk associated with having no financial assurance mechanism (0.0342 times the failure rate of each net worth category). Exhibit 5 shows the assurance risk of standby letters of credit issued by SAIF/FSLIC insured thrifts by net worth category.

Exhibit 5: Assurance Risk of Standby letters of Credit Issued By SAIF/FSLIC Insured Thrifts By Net Worth Category		
Net Worth ($ million)	**Failure Rate (%)**	**Assurance Risk (%)**
1 -10	1.6	0.055
10 - 20	1.5	0.051
20 - 100	1.1	0.038
100 +	0.7	0.024

The assurance risks shown in Exhibit 5 reflect the unprecedented number of thrift failures in 1988, 1989, and 1990. Despite the large increase in thrift failures over this period, assurance risk was still low, and diminished as net worth increased.

Insurance

Insurance provides a source of financial assurance that is completely independent. Assurance risk is limited to those instances when a regulated firm fails to honor its obligations and the insurance company providing the coverage for the firm's obligations becomes insolvent. The assurance risk for insurance can be calculated in the same manner as the assurance risk for surety bonds, and letters of credit.

Data reported by the Insurance Information Institute identify 225 property/casualty insurers as insolvent over the seven year period from 1984 through 1990. Therefore, the average annual number of insolvencies was 32.14 (225 failures divided by 7 years). The total number of property/casualty insurers over this period, according to information provided by the insurance departments of the various states, averaged 3,800. Thus, the annual failure rate for property casualty insurers was 0.85 percent (32.14 average annual number of failures divided by 3,800 insurers equal .0085). The assurance risk of the insurance mechanism would be only 0.85 percent of the assurance risk associated with having no financial assurance mechanism (0.0085 times the failure rate of each net worth category). Exhibit 6 shows that this assurance risk is extremely low for firms in any net worth category.

Exhibit 6: Assurance Risk of Insurance by Net Worth Category		
Net Worth ($ million)	**Failure Rate (%)**	**Assurance Risk (%)**
1 -10	1.6	0.014
10 - 20	1.5	0.013
20 - 100	1.1	0.009
100 +	0.7	0.006

The assurance risk ranges from a high of 0.014 percent to a low of 0.006 percent. The overall level of assurance risk for firms using insurance as a financial assurance mechanism is low and diminishes as net worth increases.

Trust funds, surety bonds, letters of credit, and insurance all pose very little assurance risk to the Agency. Their effectiveness in assuring closure/post closure costs is a function of the failure rate of the firms and the failure rate of the third-party mechanism provider. These two independent probabilities make the overall level of assurance risk low. It is important to note, however, that all of these mechanisms pose some assurance risk that may result in instances in which the government will become responsible for closure/post closure costs despite the use of approved third-party mechanisms. Furthermore, the degree of assurance risk varies across mechanisms. Based on the small level of risk, however, the Agency has concluded that all of these mechanisms provide acceptable, and substantially equivalent degrees of financial assurance.

3. Criteria for Selecting Best Financial Test

In developing the July 1, 1991 proposed rule, the Agency's objective was twofold: (1) maximize the availability of the financial test in order to minimize the costs to regulated firms of obtaining alternative financial instruments, and (2) minimize the number of firms allowed to use the test that later go bankrupt without covering their environmental obligations, thereby minimizing the costs borne by the public to cover obligations of bankrupt firms. Third-party financial assurance mechanisms are more costly to the firms than using the proposed Subtitles C and D financial assurance test. The use of third-party financial assurance mechanisms therefore increases costs to the private sector. However, it is clear from the preceding exhibits that the overall level of assurance risk posed by third-party mechanisms is somewhat smaller than the overall level of assurance risk posed by the financial test. This suggests that the financial test is more costly to the public than third-party assurance mechanisms.

While it is therefore true that allowing regulated firms to use a financial test may increase public costs, disallowing use of the financial test will not necessarily eliminate those costs. Firms not allowed to use the financial test will need to secure a higher cost third-party mechanism. Some of this increased cost will be passed on to the consumer of the regulated firm's products or services. Thus "the public" (i.e. the consumer/taxpayer) will incur costs either directly (if a firm using the financial test cannot pay closure/post-closure care costs) or

indirectly (when a firm must pay more for a third-party mechanism and passes the additional cost on to the consumer). For example, the costs to MSWLF firms associated with obtaining third-party financial assurance mechanisms may be passed on to the public in the form of higher tipping fees, and/or increased taxes. As a consequence, the Agency used a modified least-cost criterion (i.e., minimizing the sum of public and private costs of the financial test) in choosing the most appropriate test.

The method used by the Agency in selecting the proposed Subtitle C and D financial assurance test is consistent with its actions in promulgating financial assurance requirements in 1980. The May 1980 re-proposal addressed concerns by commenters that allowing trust funds as the only acceptable financial assurance mechanism was financially burdensome.[3] In response to these concerns, the Agency added several alternative mechanisms. These mechanisms pose somewhat more financial assurance risk to the government than trust funds. Insurance, surety bonds, and letters of credit are progressively riskier than trust funds, but are less expensive for the firms to obtain. Thus, by including these additional financial assurance mechanisms the Agency was able to lower the total (public and private) costs. This same reasoning was used by the Agency in determining the current proposed Subtitle C and D financial test. The Agency accepted a relatively small increase in assurance risk to obtain a decrease in private costs, therefore minimizing the sum of public and private costs.

[3] EPA/OSW, Background Document for Revisions to the Subtitle C Financial Tests For Closure, Post-Closure Care, and Liability Coverage, p. 2-2.

REFERENCES

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U.S. Environmental Protection Agency, Office of Solid Waste. Background Document: Subtitle D Financial Tests for Closure, Post-Closure, and Corrective Action (40 CFR Part 258), December 15, 1992.