

CSSCO Whitepaper 3 – Financial and Legal Considerations

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To each and every one of you, Thanks!

Executive Summary

This whitepaper is the third in a series of three that investigates the possible formation of an independent Control System Security Certification Organization (CSSCO) to create well-engineered specifications and processes for the security testing and certification of critical control system products. It discusses the legal considerations as well as the financial and resource requirements for the organization at startup and as it matures.

Over the past few years, security researchers have shown that SCADA and control systems products can have serious security vulnerabilities that can leave critical systems exposed to viruses, hackers and possibly terrorist activities from around the world. Operations-focused standards such as ISA SP-99 and NERC CIP-002-009 help the end-users ensure that their control systems are managed in a secure manner, but there are no coordinated efforts under way to establish procedures for the security testing and certification of the actual products used in these control systems. Like the weak brick in a well designed wall, this lack of product-focused security undermines the efforts of the operational security standards.

To address this short coming, industry leaders have proposed that an organization be formed to both create well-engineered specifications and processes for the testing and certification of critical control systems products and to accelerate the development of industry standards that can be used as a basis for these certifications. The focus of this certification would include all network capable products that lie between the final field elements and the security gateway that separates the control system from the business network.

This final whitepaper discusses the legal considerations as well as the financial and resource requirements for the organization at startup and as it matures. The suggested structure for the CSSCO is an incorporated organization based on a not-for-profit model. If incorporated in the United States, it should be formed as federally tax exempt trade associations under IRS Section 501(c)(6). Forming as a public charity, under IRS Section 501(c)(3) is not recommended.

One of the most critical legal considerations is developing an intellectual policy to handle IP brought into the CSSCO by member companies. If the CSSCO is going to be successful, there will have to be open contribution of IP and ideas from members on security testing. To facilitate this, the CSSCO must create and document an IP policy that has been proven in the courts and standard enough that the legal departments of the various member companies will not object to it. During our investigation we became aware of a number of cases where these conditions were not met, the legal departments of the members became stalemated and the consortium collapsed.

Another important legal consideration is the development of clear and consistent policy for usage of a CSSCO trademark along with protection of that trademark. The value of any certification program is predicated on trust in the certification body's ability to deliver on the certification promise. It is vital to create and maintain that trust in the CSSCO's assurance process throughout the market and this can only be done by ensuring that the CSSCO's certification mark is consistently applied and is protected from misuse or false claims.

On the other hand, liability and anti-trust issues may be secondary to other concerns. Based on past cases, the risk of liability actions against the members of certification organization is negligible and does not require special attention by the CSSCO during its formation. Similarly, federal enforcement actions against consortia and their members have been extremely rare and most have been concerning non-disclosure of relevant IP ownership or cases where the members deliberately used the standards organization to exclude a competitor from the market. Considering the area of interest for the CSSCO and its potential members, it is the author's opinion that these antitrust issues are unlikely to arise in the CSSCO. In addition, the wide mix of member types, including end-users, vendors, consultants, test houses and government bodies will greatly reduce the possibility of anti-trust concerns. Most other industry certification organizations are far more vendor-centric and yet none that we are aware of have had any anti-trust issues. Regardless, we strongly recommend that the CSSCO either obtain assistance from an organization specializing in technology consortium creation and management or engage legal guidance from lawyers specialized in the formation of certification bodies.

Companies interested in being active members should plan to have an executive officer of their company on the Executive Board for determining the strategy of the CSSCO. Based on similar organizations this will require that the elected officer attend two to four board meetings per year and a monthly one hour teleconference call. For technical staff commitments we have assumed that the members supply 2 person-years of technical assistance and another 2 person-years be hired as professional experts on an annual basis until the testing methods are stabilized.

A three year budget was compiled that shows estimated expenses to be \$1,035,000 in year one, \$900,000 in year two and \$1,000,000 in year three. Revenues are expected to be \$970,000 in years one and two and \$1,070,000 in year three. We expect it will require about six months to set up the basic CSSCO structure and 18 to 24 months to complete and create the specific assurance requirements and test methodologies to a point where testing can begin. Testing service and certification would then occur after that.

1 Introduction

This report is the third in a series of whitepapers investigating the possible formation of an independent Control System Security Certification Organization (CSSCO) to create well-engineered specifications and processes for the security testing and certification of critical control systemⁱ products. The full study is divided into three whitepapers as follows:

- **CSSCO Whitepaper #1: Organizational Objectives** – discusses why the organization is required, what it would achieve and how it would relate to other organizational bodies:
 1. Needs analysis for a Control System Security Certification organization;
 2. Objectives, goals and tasks involved in security certification of control products;
 3. Relationships and interaction with other industrial security standards bodies.
- **CSSCO Whitepaper #2: Organizational Models** – discusses how the organization could be structured and governed to achieve its maximum potential, including:
 1. Investigation of critical success factors in other industrial certification organizations;
 2. Governance, membership and voting models;
 3. A proposed path to create a third party certification process for control products.
- **CSSCO Whitepaper #3: Legal and Financial Considerations** – discusses the legal considerations as well as financial and resource requirements for the organization at startup and as it matures:
 1. An incorporation model designed to best meet the needs of industry (e.g. non-profit vs. for-profit, jurisdiction of the organization, etc.);
 2. Legal and property rights considerations;
 3. Proposed initial budget and membership fee model;
 4. Estimation of member commitment requirements in time and people;
 5. A multiyear time line and milestones for the setup and operation of the organization;

ⁱ The term “control system” is used in this paper to represent any industrial automation system including Supervisory Control and Data Acquisition (SCADA) Distributed Control Systems (DCS), Programmable Logic Controllers (PLC), Remote Terminal Units (RTU), Emergency Shutdown (ESD) systems and safety control systems.

2 Legal Considerations

In this section we look at the legal considerations for forming the CSSCO. While there is no "one size fits all" way to create a certification consortium, most legal experts in the area of consortium operations suggest that there are reasonably defined variations and "best practices" to follow in creating one. In the subsections below we have attempted to distil our findings on what those best practises might be.

2.1 Possible Jurisdiction and Models for Incorporation

Discussions regarding the incorporation of a certification entity generally revolve around three questions, namely:

- Whether to form an incorporated consortium or use another model such as an unincorporated joint development project?
- If incorporated, what jurisdiction should this occur in?
- If incorporated in the United States, whether to be non-profit or for-profit?

To address the first question, we interviewed several legal experts and surveyed the status of similar industrial consortium with certification functions, such as the Fieldbus Foundation, ODVA and OPC Foundation. Nearly all of the well-known industrial organizations are incorporated. This was also recommended by the various legal experts and legal guidelines reviewed. For example, Andrew Updegrove states:

“Other common models, such as the unincorporated promoter/adopter structure, which mimics a commercial joint venture, in most cases have severe drawbacks which make them more expensive to form, more difficult to operate, and less "open" in industry perception. While the opposite is often supposed, it can be cheaper and easier to form an incorporated consortium than one formed under a joint development model.”¹

The next question is the location of the incorporation. Unfortunately, at the time of writing we were unable to obtain a definitive answer to this question. It appears that since most industry certification bodies are vendor driven, they are incorporated in the country and state where one of the founding vendors resides. In the case of the CSSCO, this option is less obvious as the distribution of interested members is highly international. However, should the US be chosen as the incorporation location, a corporate structure formed under the laws of the State of Delaware is likely to provide maximum flexibility in operation, and will provide a level of comfort to international companies, which are often most familiar with the laws of that jurisdiction.

Finally we address the questions of for-profit versus non-profit and related tax-exempt status. While most people assume that all certification and testing organizations are non-profit, a surprising number are not. The most outstanding example is the TUV Rheinland Group, which is a publicly traded company that reported a profit of over \$51,000,000 USD in 2005². On the other hand, the Underwriters Laboratories Inc. (UL) is an independent, not-for-profit product-safety testing and certification organization. Both are highly successful and well regarded in industry.

The greatest benefit of non-profit status, apart from generally not having to pay taxes, is that the organization is freed from the chore of having to make sure its income is "zeroed out" at the end of each year. As Andrew Updegrove notes:

“Just because an organization is not intended to operate at a profit does not mean that it will not have taxable income at the end of the year. By obtaining exempt status, financial planning for the organization is greatly simplified. Given the relatively light staffing levels of most consortia, simpler is better.”

The other advantages of a non-profit organization are the entrenchment of member-neutrality required for non-profit status and that the non-profit designation may be an advantage in enhancing public perception. Contrary to the common belief, contributions from members rarely qualify for a tax deduction since this type of organization is typically considered under IRS Section 501(c)(6), which grants tax-exempt status to "business leagues, chambers of

commerce, real estate boards, boards of trade or professional football leagues..., not organized for profit and no part of the net earnings of which inures to the benefit of any private shareholder or individual.”³ Again Andrew Updegrave has some suggestions on this matter:

“The majority of consortia can be formed as federally tax exempt trade associations under IRS Section 501(c)(6). Some consortia have also been formed as public charities, under IRS Section 501(c)(3), but this is almost always inadvisable. Where it is possible to meet the requirements of tax exemption, it is better to forego that status in the event that the goals of the organization cannot be met within the confines of tax exempt status. Happily, that is usually unnecessary, particularly since it is often possible to set up a taxable subsidiary to undertake any activities which would jeopardize the exempt status of the parent consortium.”⁴

Disadvantages of nonprofit status are relatively minor, the biggest being that without the profit motive another significant motivational factor is required to keep the organization moving forward aggressively. Finding this motivational factor is not always easy. That said, provided that the board is careful to keep itself adequately balanced and motivated toward the end goals, a not-for-profit model would appear to be the best fit for the CSSCO’s needs.

2.2 Intellectual Property Rights

Intellectual property (IP) issues for standards and certification organizations typically fall into two categories. The first is how to handle IP that is created by the organization, namely who owns the IP and how is its value realized? This turns out to be a fairly trivial problem to address, as a bylaw stating that the organization owns and will take advantage of the IP created internally can be easily crafted.

The second and more difficult issue is how to handle IP brought into the CSSCO by member companies. For example, a famous example in consortium case law is the 1995 Federal Trade Commission Consent Decree⁵ against Dell Computer Corp. where the existence of the patent by Dell was not disclosed at the time the standard was negotiated.⁶

“The basis for that sanction was a claim that Dell had participated in a standard setting process and had failed to disclose that it owned a patent which it believed would be infringed by any implementation of the standard under consideration. Only after the adoption of that standard and its initial commercialization did Dell identify its patent and assert a right to require royalties. The government asserted that such behavior was a violation of the antitrust laws, and as part of the consent decree, Dell agreed that it would grant a royalty-free license to any implementer of the standard. Had Dell disclosed its patent during the course of the adoption process, it could have stated its intention to require a royalty from implementers, and the working group could have decided whether to write the standard in such a way as to avoid infringement, or knowingly adopt the standard subject to the royalty requirement.”⁷

Similar, but less controversial examples have also occurred in the industrial controls world, such as the admission that technology patented by Emerson Process Management (the “Warrior Patent”) was critical to the operation of the Foundation Fieldbus (FF) standard. Considerable discussion occurred on whether or not Emerson was obliged to transfer the patent to the Fieldbus Foundation and if they might charge users of the FF standard a royalty fee. In the end they did not.

Thus for a variety of reasons - not the least of which is avoiding liability under the antitrust and other laws - it is essential for the CSSCO to adopt a well thought-out IPR policy to govern its activities:

“For another example, adopting mainstream intellectual property rights (“IPR”) policies is essential to success, since many companies have firm rules against joining consortia with certain provisions in their policies. Similarly, the rules which have been adopted by some consortia are so restrictive that they can seriously impede the adoption of the very specifications and standards which the same consortia were formed to promote. As a result of having flawed (or no) IPR policies, some consortia have found that their IPR processes have allowed situations to arise that have resulted in both private law suits as well as

Federal antitrust actions. The resulting controversies have hampered the efforts of these consortia to succeed, and have resulted in serious inconvenience and cost to some of their members.”⁸

In other words, the CSSCO must create and document an IP policy that has been proven in the courts and is standard enough that the legal departments of the various member companies will not object to it. During our investigation we became aware of a number of cases where these conditions were not met, the legal departments of the members became stalemated and the consortium collapsed.

If the CSSCO is going to be successful, there will have to be open contribution of IP and ideas from members on security testing. Considering the extensive discussion we have experienced in the past with the legal departments of several of the potential members over minor legal documents such as non-disclosure agreements, it is critical that this be addressed early in the CSSCO’s formation. If it is not, then it is highly likely that critical contributions of knowledge from members will dry up and the CSSCO will fail.

2.3 Antitrust Issues

Organizations like the CSSCO almost always, by their nature, include competitors among their members. As a result, it is essential that the CSSCO conduct its operations in compliance with federal, state and international antitrust laws. This will involve adopting, and following, a policy specifically addressing antitrust compliance issues.

It is important to note that federal enforcement actions against consortia and their members have been extremely rare. Most have been concerning non-disclosure of relevant IP ownership (such as the Dell case noted above), or cases where the members deliberately used the standards organization to exclude a competitor from the market. Considering the area of interest for the CSSCO and its potential members, it is the author’s opinion that these antitrust issues are unlikely to arise in the CSSCO.

In addition, the wide mix of member types, including end-users, vendors, consultants, test houses and government bodies will greatly reduce the possibility of anti-trust concerns. Most other industry certification organizations are far more vendor-centric and yet none that we are aware of have had any anti-trust issues.

That said, we believe that the CSSCO should adopt an anti-trust policy that is based on one that has been previously proven in the courts. Not only will this reduce the risk of anti-trust action against the CSSCO, but more importantly it will reduce the possibility of legal haggling between various members during the formation of the CSSCO.

2.4 Protection of CSSCO Certification Trademarks

As we noted in White Paper #2, the value of any certification program is predicated on trust in the certification body’s ability to deliver on the certification promise. It is vital to create and maintain that trust in the CSSCO’s assurance process throughout the market and this can only be done by ensuring that the CSSCO’s certification mark is consistently applied and is protected from misuse or false claims. This requires the development of clear and consistent policy for usage of a CSSCO trademark, a topic discussed in some detail in White Paper #2. It also may require a formal trademark registration in the United States and Internationally. Andrew Updegrave offers the following comments on this:

“While it is not legally necessary to obtain a formal trademark registration in the United States on the name of a standard in order to own all rights to its usage, it is prudent to do so, since the cost is modest in comparison to the benefit of putting the world on notice that the consortium owns the trademark. Since it is widely known that it is very simple to perform an on-line search of issued trademarks, obtaining a trademark registration will make it far less likely that someone else will adopt the same, or a confusingly similar, trademark. As a result, there will be less potential that someone else’s actions will dilute the value and effectiveness of the consortium’s mark, or that the consortium will be put to the trouble and expense of asserting or defending its trademark.

Since standards are usually intended to be international, a global trademark program can become expensive, however. Fortunately, trademark conventions now exist in a few regions (such as Europe) which permit single filings to cover multiple countries. As a practical matter, it is possible to achieve a very meaningful degree of protection by obtaining trademark protection in just the US, Europe and selected Pacific Rim countries. Such a limited program of trademark registration can be completed within the budget of most consortia.”⁹

Thus the process and expense of protecting a CSSCO Certification mark through trademarks is something that the organization should seriously consider during its formation.

2.5 Liability Issues

One often mentioned concern is regarding the legal liability of a certification organization member’s. Could the member companies of the consortium be sued because of some error in the certification process or the results?

It turns out that the chance of this occurring is negligible. According to a report prepared for the ISA on the liability of conformance assessment bodies:

“The overall degree of risk for parent associations with non-profit “subsidiaries” conducting conformity assessments such as product or service certification is not high. The case law governing product and professional certification bodies is fairly “thin.” Some old precedent and recent cases indicate that liability may be found if a certification body was to act negligently in conducting such assessments or granting certification. That being said, we are aware of no certification body being held liable for third party tort or similar causes of action”¹⁰

Thus we believe this particular area concern does not require special attention by the CSSCO during its formation.

2.6 Required Legal Documents

Based on the above, the initial legal documentation we expect the CSSCO to require at or soon after incorporation includes:

- **Certificate of Incorporation** - the limited number of rights and rules which by law must be set forth at the time of incorporation.
- **Detailed Bylaws** - the legal and procedural rules of operation, the governance structure, the classes of membership and their rights, and other provisions which enable the day by day operation of the organization.
- **Intellectual Property Rights Policy** - the high level rules of the organization and its technology adoption process in terms of both member contribution of IP and use of developed IP.
- **Policies and Procedures of the Technical Committee** - a detailed document describing all of the day by day rules of the technical process, such as notice and quorum requirements, meeting rules, chairperson duties, and so on.
- **Membership Application** – the legal contract by means of which a company becomes a member and agrees to be bound by the rules of the organization.

In addition, there may be further board-adopted policies, as well as liaison agreements with other consortia, leases, development contracts, grant agreements, management contracts with hosting companies, and other legal documentation necessary to support the efforts of the CSSCO. However these can be developed on an as needed basis.

Many certification bodies often seem to re-invent the wheel when it comes to these documents, or blindly copy the legal documentation of another organization. The first alternative is clearly a waste of valuable CSSCO resources and the second may fail because the organization selected a model to copy from that is either inappropriate for the

task at hand, or represents a less than an ideal organization in its own right. Thus we strongly recommend that the CSSCO either obtain assistance from an organization specializing in technology consortium creation and management (such as the Open Group) or engage legal guidance from lawyers specialized in the formation of certification bodies (such as either Andrew Updegrave or Jefferson Glassie).

3 Financial Requirements and Budget

3.1 Estimated Expenses for Initial Setup

The initial setup of the CSSCO will likely require a substantial outlay for four main purposes – legal setup, marketing, administration and initial guidance/ organizational facilitation. Estimates for these costs are shown in Table 1 below.

Expense	Low Range	Mid Range
Incorporation Costs	\$5000	\$15,000
Development of Required Legal Documents	\$10,000	\$50,000
Trademark Registration	\$2000	\$10,000
Meeting/Tele-conference Costs	\$1000	\$10,000
Facilitation to Determine Intent and Commitment of Founding Members and to Determine Formal Goals and Objectives	\$5000	\$30,000
Marketing Strategy and Brand Development	\$5000	\$15,000
Website Development	\$5000	\$10,000
Basic Administration Services	\$3000	\$15,000
Documents, Supplies and Printed Materials	\$2000	\$10,000
Totals	\$38,000	\$160,000

Table 1: Estimate Range of Initial Costs for CSSCO Start-up

The range of prices is due to two factors, the amount of volunteer labour to arrange and produce much of the needed policies and documentation and the level of professionalism expected. The lower range is for setting up a small volunteer-intensive organization such as the Modbus-IDA Organization or now disbanded IAONA organization. The mid-range represents the costs for a more professional and ambitious body such as the Fieldbus Foundation. For example, the Open Group recently managed the start up of a consortium with nine founding members at a cost of \$20,000 per member for initial fees (a total of \$180,000). At the high range, the total costs are typically in the \$500,000 and up. The CSSCO is more likely to need to be a highly professional body with limited non-technical volunteer resources

3.2 Ongoing Operational Costs

Once the CSSCO is operational, the costs shift towards salaries, administration costs for managing the certification process and marketing and out reach costs. All of these can vary significantly, since expenses like marketing can easily range into the millions of dollars if the organization wishes to aggressively publicize its existence and benefits at very many international trade shows. Similarly, if the CSSCO only wishes to develop *Self-Certification with Verification* programs then management costs will be quite low. However once the CSSCO moves into full *Third Party Certification* mode the costs of administering such a program jump significantly. Table 2 below shows a possible range of costs for the first year of operation.

Note that these costs do not include the costs of creating technical specification documents and test methodologies. These are covered in the next section.

Expense	Low Range	Mid Range
Executive Salaries	\$25,000	\$150,000
Administrative Staff Salaries	\$10,000	\$50,000
Technical Staff Salaries	\$0	\$100,000
Meeting/Tele-conference Costs	\$2,000	\$50,000
Legal and Accounting	\$5,000	\$30,000
Marketing and Outreach	\$5,000	\$75,000
Website Management	\$5,000	\$20,000
Office Costs	\$40,000	\$100,000
Totals	\$92,000	\$575,000

Table 2: Estimate Range of Annual Expenses for CSSCO Operation

3.3 Technical Development Costs

Early in the first whitepaper we discussed how considerable technical development work will be required if the CSSCO is going to create a meaningful program for control product security certification. Not only do the testing methodologies need to be developed, but many of the actual specifications and security requirements need to be created. How does this happen? Again we turn to Andrew Updegrave for guidance:

“Test suite development almost invariably is either funded by consortium dues, or a suite is contributed by a member (often the same member that may have contributed the technology to which the test suite relates).”¹¹

For most industrial organizations, key technologies are likely to come from three main sources, namely volunteer-driven research and development, professionally funded research and development and contribution of technologies from members. In the case of standards efforts like SP-99, the first and last sources dominate, with minor amounts of funded development. Unfortunately while volunteer-based efforts are good for the standards development, they rarely work well for compliance testing. Furthermore, the price for efforts that are largely volunteer-driven is that they take a long time. For example, the ISA SP-99 standards have been in development for over four years and still have yet to deliver a completed standard.ⁱⁱ

Thus if the CSSCO wants to pursue a more aggressive schedule it will either have to rely on donated testing methodologies and technologies from its key members or fund professional development of these technologies. The former is particularly a possibility for some tests as a number of end-users and a few vendors have started to develop detailed factory acceptance tests for security of control systems. However this contribution is likely to require addition development. Thus assuming some contribution of security testing methods from key members, the CSSCO will need to budget for the professional funding of technical development as shown in Table 3 below.

ⁱⁱ It is worth noting that this is not to discredit the ISA SP-99 efforts, but rather to illustrate the natural pace of volunteer-drive efforts. In fact, numerous observers from the field of safety standards have commented that this four year process for the ISA security standards was exceptionally fast for standards development.

Technical Phase	Low Range	Mid Range
Assistance for Setting Technical Direction of CSSCO a. Establish Security Requirements b. Determine Reasonable Technical Objectives for Certification c. Identify Technical Resource Requirements (and Budget) d. Locate Appropriate Technical Resources	\$10,000	\$25,000
Create Interim Standards as Certification Targets a. Research Existing Security Standards for Appropriate Requirements b. Research Corporate In-house Standards and Procedures for Appropriate Requirements c. Compile a Current “Body of Knowledge” on Existing Control System Security Protect Requirements d. Conduct Gap Analysis e. Define Measurable Product Security Requirements f. Offer Security Requirements for Member or Public Comment g. Converted to Standards-like Language	\$50,000	\$100,000
Create Specific Assurance Requirements and Test Methodologies a. Define Compliance Requirements b. Create Draft Testing Methodologies and Specifications c. Conduct Trials of Testing Methodologies d. Revise Testing Methodologies e. Release Preliminary Testing Methodologies f. Finalize Testing Methodologies and Processes	\$100,000	\$250,000
Enable Provision of Services to Conduct Certification Testing	\$0	\$100,000
Totals	\$160,000	\$475,000

Table 3: Estimated Costs for Technical Development of Testing Methodology Development (Year 1)

As in the previous estimates there is a wide variation in what the CSSCO might wish to achieve in terms of both technical coverage and the range of equipment tested. If only basic tests for security of Windows platforms are needed, then much of this technology can be borrowed from the IT community. However, if in-depth security testing is expected or the testing expands to embedded control products, then the costs will jump significantly.

Finally the actual testing service costs could be recoverable from testing fees or methodology/certification licence fees. However at least initially, the CSSCO should be prepared for some expenses in this area as the bugs in both the tests and the certification process are worked out.

3.4 Membership Fee Model

All these expenses clearly beg the question “so how do we pay for this?” The answer is membership, certification and testing fees. It turns out that, except for special cases, the second two rarely do more than cover their costs and do not provide any funds for development:

“While consortia are often formed to create necessary standards, they are most frequently low-budget organizations, and both test suite development and certification testing are expensive processes. Only rarely does a situation arise where the market for certification testing is large enough to provide adequate incentives to a private testing service to incur the cost of test suite development.”¹²

Thus the CSSCO will need a membership fee structure that can support its objectives. Typically most organizations have multiple membership classes offering a broad array of rights at a sliding cost scale. For a general guideline we look at suggestions from Consortium.Org:

A typical range of membership classes to be found in a standard-setting consortium with a large number of membership classes, and the benefits and obligations of each class, would be similar to the following:

Strategic Member: *Guaranteed board seat, or reasonable likelihood of eventually gaining one, and all privileges of lower categories of membership (other than the right to vote for additional directors)*

Appeals to: Companies which wish to set the strategic objectives of the consortium

Cost: \$15,000 - \$50,000, depending on revenues of member

Technical Committee Member: *Full, voting participation in all technical and marketing processes; as a class, can elect two board representatives; all privileges of lower categories of membership*

Appeals to: Companies wishing to influence standard setting process

Cost: \$7,500 - \$25,000, depending on revenues of member

Advisory Member: *May send one non-voting member to all technical and marketing processes; all privileges of lower categories of membership*

Appeals to: Companies primarily wishing to have most timely information regarding technical direction and results

Cost: \$5,000 (regardless of revenues)

Informational Member: *Receives periodic information regarding technical and other programs, as well as standards as they are made public*

Appeals to: Academics, consultants, analysts

Cost: \$500 (regardless of revenues)

Each of the classes described above is crafted to appeal to companies with a particular focus. Using the categories referred to in Section II above, "leaders" will always join at the Strategic or Technical Committee membership levels, "followers" will join at the Technical Committee or Advisory Member levels, and "spectators" will join as Informational Members.

In addition to differentiating by revenues in order to broaden participation, consortia will at times provide the same benefits to different types of companies for radically different prices. This occurs where the participation of a particular type of company is essential, but the market motivation of participation for that type of company is low. An example would be a consortium formed by hardware vendors to promote a new operating system, where the vendors wish to provide incentives to a large number of independent software vendors to allocate the resources necessary to port their products to the new platform. In such a situation, hardware vendors may pay very large dues, while ISVs may be invited to become members at little or no cost.

The next step was to compare these suggestions to typical fees charged in industrial controls organizations. To do this we looked at four organizations that offer a range of “certification” options to the control industry; Modbus-IDA, OPC Foundation, ODVA and Fieldbus Foundation. Table 4 summarizes these findings below. Note that there is some interpretation required in doing this comparison; for example, mapping the names from Consortium.Org to ones that specific organizations use can be a challenge. Differences between what is considered a small or large company also varies between organizations, as some base this on number of employees while others base it on revenues. Other groups do not consider it a factor at all.

	Consortium. org Guidelines	Modbus- IDA ¹³	OPC Foundation ¹⁴	ODVA ¹⁵	Fieldbus Foundation
Services Offered		Limited specification and testing services	Specification only – no compliance testing available	Full specification and compliance certification services	Full specification and compliance certification services
Initiation/Founding Member Fee				\$50,000	\$125,000 forgivable loans
Strategic/Executive Member Fee (Large Co)	\$50,000	\$40,000	\$12,000	\$50,000	\$60,000
Strategic/Executive Member Fee (Small Co)	\$15,000		\$3,000		\$12,500
Technical Committee Member Fee(Large Co)	\$25,000	\$3,500		\$5,000	
Technical Committee Member Fee(Small Co)	\$7,500	\$1,500			
Advisory Member Fee (End User Fee?) ⁱⁱⁱ	\$5,000			\$1,000	\$1,500
Informational Member Fee	\$500	\$500	\$500	\$750	\$ 1,000

Table 4: Comparison of Membership Costs in Industrial Organizations

So what should the CSSCO charge as membership fees and how should that be divided between the different member types? Ultimately the price of the CSSCO membership needs to be balanced with the perceived benefits that the members will receive. Since the CSSCO’s target objective is to offer full specification and compliance certification services, it is comparable to organizations like the Fieldbus Foundation and ODVA. However, unlike these two groups, the CSSCO is not as vendor-centric. The vendors are primary beneficiaries of the ODVA and Fieldbus Foundation efforts (since tested interoperability helps sell product), while both end-users and vendors will be the beneficiaries of a CSSCO certification. This is confirmed by the types of members currently supporting this study – instead of a dominance of vendors the list is fairly evenly divided between vendors and end-users. So it is likely that the special low membership prices for end-users that are common in the fieldbus/devicebus type organizations are not appropriate for the CSSCO.

Determining what constitutes a large or small organization also needs to be considered. For example, the Fieldbus Foundation bases the company size on “operating revenues from the sale or license of industrial automation/instrumentation/control products by the applicant”. While this works well for vendors, it means little for end-users since generally they do not receive any revenues from the sale of industrial control products. Other possibilities could be total number of I/O control points sold or owned, but then this could misrepresent members such as Symantec who do not sell control equipment but could benefit significantly from the CSSCO. Thus we believe a fairer measure for size determination might be number of employees, the measure that Modbus-IDA organization uses.

ⁱⁱⁱ We have assumed that the advisory member referred to by Consortium.Org is similar to an end-user member in the industrial communication organizations, since end-users effectively play an advisory role in these groups.

Combining the above information with the membership types proposed in Whitepaper #2 results in a possible membership fee structure as shown in Table 5:

Membership	Definition	Benefits	Fees
Founding Member Fee		Special voting rights during formation, Extra Votes in Operation Mode, Special rates for testing?	\$50,000 Forgivable Loan
A - Executive Member (Large Co)	End-users, vendors, consultants and testing houses with >5,000 employees	Can be on Boards Voting Rights	\$50,000
B - Executive Member (Medium Co)	End-users, vendors, consultants and testing houses with >100 – 5,000 employees	Can be on Boards Voting Rights	\$15,000
C - Executive Member (Small Co)	End-users, vendors, consultants and testing houses with <100 employees	Can be on Boards Voting Rights	\$2,000
D - Technical Committee Member	Government Agencies (US Domestic and Foreign)	Can be on Board or Tech Committee (1 seat) but No AGM voting rights	\$1,000
E - Associate Members	Academics or Individuals	Information Only Cannot be on Boards No voting rights	\$750

Table 5: Possible Membership Fee Structure for CSSCO

It is important to remember that this fee structure is preliminary in nature and will need to be properly analyzed through a market analysis. As we noted above, the price of the CSSCO membership needs to be balanced with what the members believe they will receive in benefits or they will not join.

3.5 Preliminary Budget

Using the above estimates we have created a three-year budget for the CSSCO as shown in Table 6. On the expense side it assumes that the initial setup costs are addressed in the first year, the annual operating costs (except for direct certification management costs) increase by approximately 10% per year and that technical development costs decrease after the first year. It also assumes that membership revenues remain constant over the period and that the costs of administrating certification claims can be covered by fees. Finally it includes \$750,000 in forgivable loans to give the organizations stability over the initial years, but no revenues are assumed for these.

	Assumptions	2007	2008	2009
Expenses				
Initial Setup		\$160,000		
Annual Operating		\$400,000	\$450,000	\$500,000
Technical Development		\$475,000	\$350,000	\$350,000
Certification Management				\$150,000
Total Expenses		\$1,035,000	\$900,000	\$1,000,000

Revenues				
Founders Forgivable Loans	15 Founding Members @ \$50K			
Membership Fees	15 A Members @ \$50K 10 B Members @ \$15K 20 C/D/E Members @ \$1K Avg.	\$970,000	\$970,000	\$970,000
Certification and Licence Fees	Fees to cover admin costs			\$150,000
Total Revenues		\$970,000	\$970,000	\$1,070,000

Table 6: Preliminary Budget for CSSCO

It is important to note that this budget is only an estimate and may vary significantly, depending on the ambitions of the CSSCO and the number of members joining.

4 Member Commitment Requirements

4.1 Executive Commitments

In Whitepaper #2 we noted that most successful certification bodies in the industrial world place senior executives on the Executive Board rather than technically focused staff. This allows the board to make decisions knowing they have the support of the member companies, rather than waiting for the board members to try to get support in their organization and report back.

This strategy is not unique to the industrial controls world. Andrew Updegrave notes:

Everyone suffers if board attendees cannot speak for their companies. A board representative should not only be involved and knowledgeable, but sufficiently senior to speak for, and gather support within, her company. It is, of course, fair to request a consortium to send out materials in advance of a meeting and a detailed agenda, as well as notice of votes that are expected to be taken. This will often allow board representatives to caucus internally at their member companies before a meeting, and therefore to speak more authoritatively on behalf of their companies at a board meeting (at least if they have read the materials before they boarded their planes). If a company is not willing to nominate a sufficiently senior employee to represent it on a consortium board, all would be better served by it passing on the privilege.

Thus we recommend that companies interested in being active members plan to have an executive officer of their company on the Executive Board for determining the strategy of the CSSCO. Based on similar organizations this will require that the elected officer attend two to four board meetings per year and a monthly one hour teleconference call.

4.2 Technical Staff Commitments

Our investigations showed that many of the major industrial communications consortiums based most of their progress on supplied engineers from vendors and suppliers. This required a significant commitment of manpower from these companies, often exceeding the equivalent of a full time staff engineer focusing on the effort from each of the key vendors. In the case of the CSSCO, the amount of technical effort that is going to be required from the main members is difficult to estimate since it will depend heavily on two factors:

- how wide ranging and comprehensive the security testing should be
- how much professional assistance the CSSCO is willing to fund

For estimation purposes we have assumed that the members supply 2 person-years of technical assistance and another 2 person-years be hired as professional experts on an annual basis until the testing methods are stabilized.

5 Proposed Timeline for the CSSCO

Finally we address the proposed timeline for the creation and operation of the CSSCO. Based on discussions with other compliance organizations, we expect it will require about six months to set up the basic CSSCO structure and 18 to 24 months to complete and create specific assurance requirements and test methodologies to a point where testing can begin. Testing service and certification would then occur after that. Below is a timeline show this progression.

Task	2007				2008			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1. Initial Setup of CSSCO								
a. Determine Intent/Commitment of Founding Members	X							
b. Form Interim Board	X							
c. Determine Formal Goals & Objectives	X							
d. Select Support Organization	X							
e. Obtain Appropriate Legal Package	X							
f. Incorporate CSSCO	X							
g. Collect Membership Dues		X						
h. Elect Board & Technical Committee.		X						
i. Select/Hire Executive Director			X					
j. Create Road Map for Objectives			X					
2. Define/Setup Overall Certification Process								
a. Define Proposed Certification Process			X	X				
b. Define Trademark Licensing Management				XX				
c. Define Basic Conformance Requirements				XX				
d. Define Operational Guidelines				X				
3. Set Technical Direction								
a. Establish Security Requirements			X					
b. Determine Technical Objectives for Certification				X				
c. Identify Technical Resource Requirements & Budget				X				
d. Locate Appropriate Technical Resources				X	X			
4. Create Specific Assurance Requirements and Test Methodologies								
a. Define Compliance Requirements					X	X		
b. Create Draft Testing Methodologies and Specs						X	X	
c. Conduct Trials of Testing Methodologies							XX	
d. Revise Testing Methodologies.								X
e. Release Preliminary Testing Methodologies.								X
f. Finalize Testing Methodologies and Processes								X
5. Provision of Certification Testing								→
6. Setup Certification Process & Enforcement								→

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