



**CONTRACT SYSTEMS  
INTEGRATION, INC.**

## **Satellite Facility Feasibility Report Monterrey, Mexico**

**Prepared for**

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## Preface

In response to a recent request for quotation received by CSI from ASTEC Advanced Power Systems and the requirements outlined therein, a preliminary feasibility study has been performed to assess the pros and cons associated with a possible expansion into Mexico, specifically, Monterrey. This feasibility study has been performed to assess initial costs and startup activities relating to the location of a satellite facility in Monterrey, in addition to maintaining current manufacturing operations in the USA.

Due to limited information and time constraints, this report is not comprehensive. Contrarily, the primary intent of this paper is to make a general assessment of the costs and efforts involved in locating a remote but supplementary facility in Monterrey, while remaining competitive with other suppliers local to the region. Once management is confident a reasonable return on investment can be attained by

such a venture, and ASTEC has selected CSI as its primary manufacturing arm, a comprehensive research effort will be launched to successfully locate a CSI presence in Monterrey.

In addition to estimated startup costs, this report will address the size and scope of the ASTEC program, the human resource elements required to support it, material logistical issues, and the market potential of neighboring industries.

Throughout this report comparisons will be made regarding the expenses and activities required of CSI versus the expenses and activities incurred by various competing bidders of the same ASTEC program, all of which are currently located in Mexico.

Once all factors have been considered, recommendations will be made at the conclusion of this report in the form of a summary.

## ASTEC Program

The initial ASTEC program consists of 41 Nortel product codes with volumes ranging from 12 to 6516 units annually. CSI has previously submitted quotes on the four units possessing the highest annual volumes. Using ASTEC raw material pricing and CSI's overhead and labor costs, the four units were valued at \$2.6 million collectively. Annual revenue to be generated from all 41 codes is estimated at \$8 million, according to sources within ASTEC.

Indications are that the supplier selected to manufacture the Nortel codes will also be awarded any new products that are introduced at the ASTEC Monterrey facility, thereby increasing annual revenue potential to significantly higher than the initial \$8 million estimate.

ASTEC has targeted the third quarter of this year for all Nortel codes to be outsourced from the Monterrey facility.

The following table lists the four units previously quoted to ASTEC and the total annual revenue generation for each.

PEC	CPC	AGR	Price	Extended
NT5C10CE	A0393136	2076	\$195.97	\$406,834
NT5C10CQ-61	A0629976	1860	\$229.02	\$425,977
NT5C12AC	A0407574	2388	\$303.43	\$724,591
NT6C12EB	A0397606	6516	\$163.92	\$1,068,102
			<b>Total:</b>	<b>\$2,625,504</b>

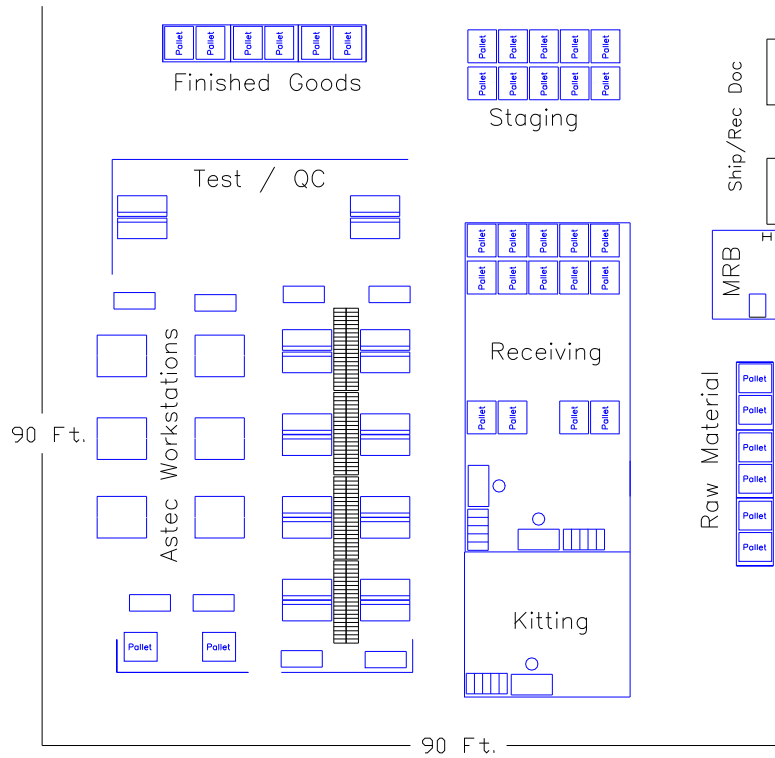
The previously quoted codes equate to roughly 33 percent of the revenue generated by the ASTEC program (\$2.6 million of the \$8 million). The following table breaks out the labor required to support the four initial codes, as well as the remaining 37 codes. The following assumptions have been made:

- Labor standards estimated for the initial four codes are actual.
- Labor standards for remaining 37 codes are directly proportionate to the labor standards of the initial four codes previously quoted.
- Normal work year is based on 2080 hours per operator.

PEC	AGR	Labor Standard	Hours Annually	Operators
NT5C10CE	2076	1.0	2076	1.0
NT5C10CQ-61	1860	1.0	1860	0.9
NT5C12AC	2388	0.5	1194	0.6
NT6C12EB	6516	1.0	6516	3.1
<b>Sub-Totals:</b>	12,840	-	11,646	5.6
<b>37 Other Codes</b>	13,056	-	23,292	11.2
<b>Total Direct Labor Requirement:</b>				<b>17</b>

The preceding table accounts for the direct labor to manufacture the various codes. Identifying the number of manufacturing operators required to support the ASTEC program gives visibility to the number of workstations and manufacturing square footage required to support such a program. Additional indirect labor will be required to support the manufacturing function and will be examined in the Human Resources portion of this report.

Based on 17 manufacturing operators CSI would need a minimum of 21 workstations to accommodate the operators as well as a dedicated area for 2 test technicians and 2 QC inspectors. This information is necessary for determining the process flow and sizing of manufacturing space requirements. One possible scenario looks like the following:



The above floor layout accounts for the materials function to receive, store, kit, pack, and ship product. There are also areas designated for receiving inspection, as well as final inspection and test. Total space requirements for manufacturing and the indirect labor supporting it are 8100 sq. ft.

Additional space would be required for office personnel such as buyer/planners, engineers, and administrators. Space allocations to accommodate office personnel are estimated at 2000 sq. ft. bringing the total floor space requirements to approximately 10,000 sq. ft. A breakdown of the costs associated with leasing 10,000 sq. ft. of industrial floor space will be outlined in the Start-up Expenses section of this report. Costs associated with both direct and indirect personnel will be outlined in the Human Resources section.

## Market Potential

CSI's mid-range goals have always included strategically locating satellite facilities around the world to better meet its customers' demands. Its strategy is to locate facilities in areas already occupied by key existing customers. A key element for expansion in any given area is the region's potential for generating new business resulting from outsourcing activity by high-tech OEMs.

To ensure the success of a satellite facility, CSI must perform a thorough investigation and market analysis of each region selected for possible expansion. Market research is both time consuming and costly and has yet to be performed, to any high degree, for the Monterrey area. However, because of the potential new business the

ASTEC program presents, CSI would go forward with the marketing analysis once ASTEC has made an honorable commitment to outsource the Nortel codes to CSI. This commitment would need to be in the form of a written contract, agreed upon by both parties, prior to CSI allocating funds for market research. In the event that ASTEC executes a contract guaranteeing CSI a predetermined amount of revenue over a predetermined time period, market analysis could possibly be waived until CSI actually had a presence in the area.

## Start-Up Expenses

This section will outline the various start-up activities and the associated costs for locating a manufacturing facility in the Monterrey area. A brief description of each type of expenditure is listed below. A table outlining projected costs for each category and a total cost for all expenses is also included.

### Lease

ASTEC indicates they currently have 2000 sq. ft. of floor space dedicated to the Nortel product, however, this figure doesn't include aisle ways, material storage locations for raw or finished goods, or office space for the personnel supporting manufacturing.

Based on the preceding scenario on pages 5 and 6, CSI would need to lease approximately 10,000 sq. ft. of manufacturing / office space to effectively manage the 41 Nortel codes destined to be outsourced by ASTEC with some available space left over for

additional ASTEC product. It would be to CSI's best interest to look for industrial space which offers expansion options in the event new business is obtained from neighboring industries.

CSI has requested that ASTEC provide information on lease agreements for manufacturing floor space within the proximity of the ASTEC industrial park. Parque Industrial Milimex was the contact provided as the source for leasing information. The figures obtained from Parque Industrial

Milimex have been used in the proceeding table.

To be included with the lease expenses are phone, utility, taxes, and insurance,

#### Facilitization

CSI would seek a facility already designed for manufacturing to minimize facilitization costs. At a minimum, CSI would have to add supplementary lighting, compressed air lines, and additional power drops to accommodate manufacturing requirements custom to CSI and the ASTEC product.

Partitions may have to be erected to separate CSI from adjacent operations or to separate various departments within CSI. Material racks for inventory storage will have to be installed if not already present. Conveyers and workbenches will be needed at various locations to move

#### Manufacturing Equipment

The necessary equipment to support the ASTEC program will have to be identified and procured. Much of the equipment will be purchased from ASTEC, such as test equipment. Remaining equipment will be sourced both locally and in the USA. Manufacturing equipment includes items such as a forklift, pallet jack(s), material carts, air and power tools, as

#### Office Furniture and Equipment

CSI will seek a professional office environment, one that adequately supports the manufacturing operation and projects the professional image of CSI. An \$8 million dollar program will require an office staff comprised of various disciplines which are outlined in the Human Resource section of this report. Office furniture such as desks,

however, these figures can not be accurately assessed without more extensive research.

material through the manufacturing process (see floor layout pg. 6). ASTEC intends on selling its workstations that currently support the Nortel codes. Those workstations have been valued at \$18,000, however, to properly configure the proposed floor layout, additional stations will have to be procured.

An ESD floor is not a requirement, however, some floor treatment may be necessary depending on the existing floor's current condition.

well as basic hand tools used in electronic assembly.

Other considerations are material bins, ESD preventative devices and testers, totes, and packaging equipment.

chairs, conference room and lobby furniture will have to be purchased or leased. Other basics such as office supplies, printers, copiers, and filing cabinets will factor into the start-up costs as well. An estimated cost for these items appears in the proceeding table.



### Information Systems

CSI will need to build an IS infrastructure at its satellite facility to model the existing one at its corporate facility. Compatible software and hardware systems will have to be purchased and installed. Much of the installation can be performed using internal sources, but some operations will need to be contracted, such as server configuration and FTP setup. Data lines will need to be installed for workstation PCs, incoming inspection / receiving areas, and possibly office areas. Additional items such as label

printers, faxes, and scanners will also have to be accounted for. CSI's web technology will need to be implemented at the Monterrey facility. The data collection system currently deployed in the USA can easily be transferred to the IS infrastructure of any remote location, however, CSI's Intranet will have to be modified to encompass a remote system. There will be costs associated with the setup to include Internet connectivity by DSL. Estimated costs for various IS elements are broken out in the following table.

### Travel

Costs associated with travel expenses are difficult to forecast, although expenses will be significant for obvious reasons. Locating a facility in the Monterrey area will be a major undertaking, and much time will be spent traveling in to and out of Mexico. Travel frequency will be high in the start-up phase of the operation, but by

implementing CSI's proven operational procedures, the Monterrey facility should quickly become self-sufficient with limited scheduled visits by corporate personnel.

*List of Start-up Expenses:*

Category	Expense	Min	Max	Comments
<b>Lease</b>		\$2,500	\$4,500	Monthly Lease
<b>Facilitization</b>	Power Drops:	\$2,000	\$4,000	
	Air Drops:	\$1,500	\$3,000	
	Storage Racks:	\$2,000	\$2,000	
	Partitions:	\$2,000	\$4,000	
	Conveyers:	\$1,000	\$1,500	
	Workbenches:	\$18,000	\$18,000	ASTECS price for six stations
	Other:	\$6,600	\$10,800	See Appendix A
<b>Capital Equipment</b>	Fork Lift:	\$5,000	\$25,000	
	Pallet Jacks:	\$1,000	\$1,000	
	Test Equip:	\$6,800	\$6,800	See Appendix B
	Tools:	\$14,600	\$14,600	See Appendix C
	Other:	\$3,750	\$7,000	See Appendix A
<b>Offices</b>	Office Cubes:	\$2,000	\$4,000	
	Furniture:	\$500	\$500	Monthly Lease
	Supplies:	\$1,500	\$3,500	
<b>IS</b>	Server:	\$8,000	\$12,000	
	PCs:	\$6,000	\$15,000	
	MRP:	\$1,500	\$2,000	Monthly Lease
	Phones:	\$300	\$400	Monthly Lease
	Copier:	\$200	\$300	Monthly Lease
	Internet Connect:	\$300	\$500	Installation
	DSL:	\$0	\$300	Monthly Fee. Service may not be available.

*List of Start-up Expenses (continued):*

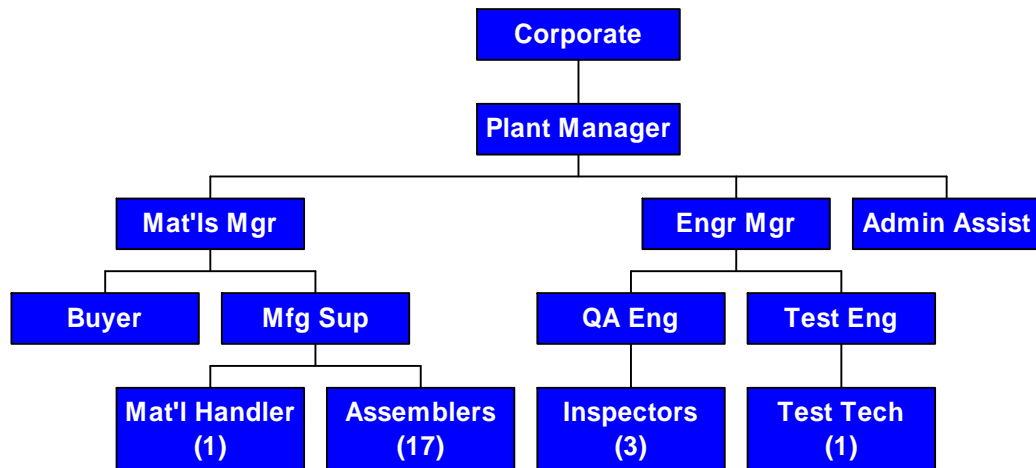
Category	Expense	Min	Max	Comments
IS	CAT Setup:	\$500	\$1,000	
	FTP:	\$200	\$500	
Travel		\$5,000	\$10,000	
<b>Totals:</b>		<b>\$92,750</b>	<b>\$147,700</b>	

## Human Resources

Human resource requirements are one of the most important elements when considering a start-up facility. The region in which the facility is located must have an adequate pool of talent in both the technical and administrative fields, as well as an abundant supply of skilled laborers. A competent workforce is paramount to the success of any company, and recruiting must be taken very seriously when filling positions, especially within a start-up organization.

The industry standard ratio for revenue generation per employee in the USA is approximately \$250,000-to-1, meaning that an \$8 million program would need roughly 32 people to support it. In Mexico, the ratio would be slightly higher, possibly \$300,000, making a total HR requirement of 27 employees.

Based on information gathered thus far, an organizational structure for a satellite operation in Monterrey would resemble the following:



This report does not address the specific requirements or qualifications for the personnel just described, nor does it address salary. It is important to note that the number of assemblers required to support the ASTEC program is probably less than projected. Indications from ASTEC are that there are currently only six workstations dedicated to the Nortel codes and each workstation is utilized on two shifts. Whether there will be twelve or seventeen assemblers needed the organizational structure will not vary to much degree, although the number of assemblers will have an impact on equipment expenditures based on a one-shift operation.

## Competing Bidders

ASTEC has narrowed its list of qualified suppliers for the Nortel codes to four, including CSI. Although the other three suppliers are all currently located in Mexico, there will still be various start-up costs incurred by those suppliers if they were to be awarded the ASTEC program. A brief description of the competing suppliers is presented here:

ORB TECH is a former Canadian company that relocated solely to the Monterrey area as a cable supplier to ASTEC. ORB TECH currently produces the majority of the cable assemblies used in the ASTEC product, however they have no box-build experience. ORB TECH learned of ASTEC's intent to outsource the 41 Nortel products and informed ASTEC that they would like to perform the full assembly of those codes in addition to supplying just the cables.

Industrial Pro Control is a box-builder that is currently located only in the Monterrey area. Industrial Pro Control is not currently contracted to do any work for ASTEC and has no prior history with ASTEC. ASTEC indicates that Industrial Pro Control does not have the technology or the tight process controls that CSI currently deploys.

Unknown - A current inductor and transformer supplier to ASTEC. This company is currently located solely in Mexico and has never offered box-build services. As in the case with ORB TECH, this company is a commodity supplier for ASTEC (in this case inductors and transformers). Upon learning of ASTEC's intention to outsource their Nortel product, they informed ASTEC of their desire to offer additional value added services.

These companies only real advantage over CSI is their current location in Mexico. CSI will have additional start-up expenses not incurred by the competing suppliers. There will however be similar start-up expenses incurred by both CSI and its competitors. ASTEC intends on selling workstations, test equipment, and tooling to the successful bidder. As outlined earlier in the start-up expenses table, these costs are significant and will have to be accounted for in the cost of the Nortel products sold to ASTEC.

## Summation

Initial recommendations are that CSI should proceed with negotiations with ASTEC regarding the 41 Nortel codes. Because all the codes have not yet been quoted, the \$8 million estimated value of the program has been used to make the following conclusions:

It is believed that in order to stay competitive, CSI cannot afford to put more than a 2% adder on its existing quoting methodology. A 2% uplift on an \$8 million program is \$160,000, a figure which should cover all start-up expenses. Any remaining expenses would have to be absorbed by CSI as part of "cost of doing business" expenses. Because CSI will want to recover its start-up expenses in the first 12 months of operation, the 2% uplift would only have to occur for the first year of the contract, thereby giving ASTEC a cost reduction in the second year.

Because of CSI's familiarity with Nortel products and the potential profit margins that can be attained, the ASTEC program should prove to be a profitable endeavor, presuming the right contractual agreements are put into place. CSI should seek a long-term commitment by ASTEC with some guarantee of revenue spread over the life of the contract. This will ensure the survivability of the satellite facility for the duration of the contract in the event that no new business is obtained.

There are other potential benefits of locating a facility in Monterrey. Having a manufacturing presence in Mexico should be appealing to companies north of the border, especially in Texas, where industry is very accessible to the Monterrey region, thus making potential new business very likely. Lower overhead and labor rates will also allow CSI to keep all high-volume / high labor type assemblies in such a region, thereby giving CSI a competitive advantage over stateside manufacturing operations.

The following steps will have to occur to make a satellite facility in Monterrey a reality. A projected time frame by which to complete these items is approximately three months:

Present start-up plans to financial community:

Adequate financing will need to be secured to cover start-up expenses and roughly two to three months worth of operational expenses (salaries, leases, direct material, etc). Start-up expenses are currently estimated to be approximately \$150,000. The additional funding required to cover initial operational expenses could run as high as \$250,000 or more depending on the aggressiveness of the product transfer plan by ASTEC. CSI would recommend a controlled ramp-up to minimize initial costs and maximize the probability for success.

Negotiate contractual terms with ASTEC:

Product Codes – Identify each code and EAU and price breakdown per product.  
Length of Contract  
Guarantees with exit clauses/conditions for each party  
New Business Opportunities within ASTEC  
General Terms (ref. other existing CSI contracts)

**On-site Due Diligence**

At least two 1-week trips to Monterrey will have to take place to perform the following activities. Meetings involving several different organizations will have to be properly coordinated to maximize the time spent in Mexico.

<b>Activity</b>	<b>Duration</b>
On-site due diligence at ASTEC's manufacturing operations assessing processes including inspection and test as well as workmanship standards.	2 Days
On-site at key suppliers, especially sheet metal and cable houses.	2 Days
Tour potential industrial sites with leasing management companies and discuss terms of various lease agreements.	2 Days
Meet with government agencies regarding incentives, corporate obligations, labor laws, etc.	1 Day
Meet with job placement agencies and other organizations which can assist in recruiting skilled personnel.	1 Day
Meet with local Networking firms and ISPs to assess IS infrastructure installation strategy.	1 Day
Meet with local contractors and suppliers to assess capital equipment expenditures and installations.	1 Day
<u>Other organizations requiring due diligence:</u> Financial Institutions Accounting Firms Educational Institutions Payroll Agencies Phone Utilities Office Furniture / Supplies Local Couriers	2 Days

*Appendix A – Other Costs*

Category	Expense	Min	Max	Comments
<b>Facilitization</b>	Workstations in addition to the ASTEC stations	\$4,200	\$8,400	\$700 per station
	MRB Cage	\$1,000	\$1,000	
	White Chain	\$1,000	\$1,000	
	Floor Tape & Dispenser	\$400	\$400	
	<b>Total:</b>	<b>\$6,600</b>	<b>\$10,800</b>	
<b>Capital Equipment</b>	Shelving	\$500	\$1,000	
	Mat'l Carts	\$2,750	\$5,500	\$275 per cart
	Dock Plate	\$500	\$500	
	<b>Total:</b>	<b>\$3,750</b>	<b>\$7,000</b>	

*Appendix B – Test Equipment*

Component	Cost Per	Qty	Extended Cost
<b>Fluke 45 Dual Display Multimeter</b>	\$800	2	\$1,600
<b>6274B DC Power Supply</b>	\$800	2	\$1,600
<b>AC/DC High Pot Tester – Biddle Instruments Cat. No. 230424</b>	\$1,800	2	\$3,600
		<b>Total Cost:</b>	<b>\$6,800</b>

*Appendix C – Tools*

Category	Description	Cost	Sets	Sub-Totals
Controller Assy	Solder Station	\$66	6	\$396
	Torque Driver	\$180	18	\$3,240
	Slotted Bit	\$7	12	\$84
	Torque Wrench	\$112	6	\$672
	Sockets	\$3	30	\$90
	Screwdriver	\$4	30	\$120
	Nut Driver	\$5	30	\$150
	Ruler	\$7	6	\$42
	Mallet	\$15	6	\$90
	Tweezers	\$3	6	\$18
	Ty-wrap Gun	\$70	6	\$420
	Scissors	\$8	6	\$54
	Cutters	\$22	6	\$132
	Strippers	\$10	6	\$60
	Heat Gun	\$50	6	\$300
				<b>Sub-Total:</b>



*Appendix C – Tools (continued):*

Category	Description	Cost	Sets	Sub-Totals
Shelf Assy	Torque Driver	\$180	24	\$4,320
	Slotted Bit	\$7	12	\$84
	Extension	\$7	6	\$42
	Torque Wrench	\$112	6	\$672
	Socket	\$3	12	\$36
	Screwdriver	\$4	18	\$72
	Nut Driver	\$5	18	\$90
	Ruler	\$7	6	\$42
	Mallet	\$15	6	\$90
	Tweezers	\$3	6	\$18
	Crimper	\$200	6	\$1,200
	Ty-wrap Gun	\$70	6	\$420
	Scissors	\$8	6	\$48
	Pliers	\$22	6	\$132
	Rivet Tool	\$240	6	\$1,440
	Screw Starter	\$8	6	\$48
				<b>Sub-Total:</b>
			<b>Total:</b>	<b>\$14,622</b>