Canadian Light Source Strategic Business Plan 2010 – 2013

Progress Review 2010

Canadian Light Source
Centre canadien de rayonnement synchrotron

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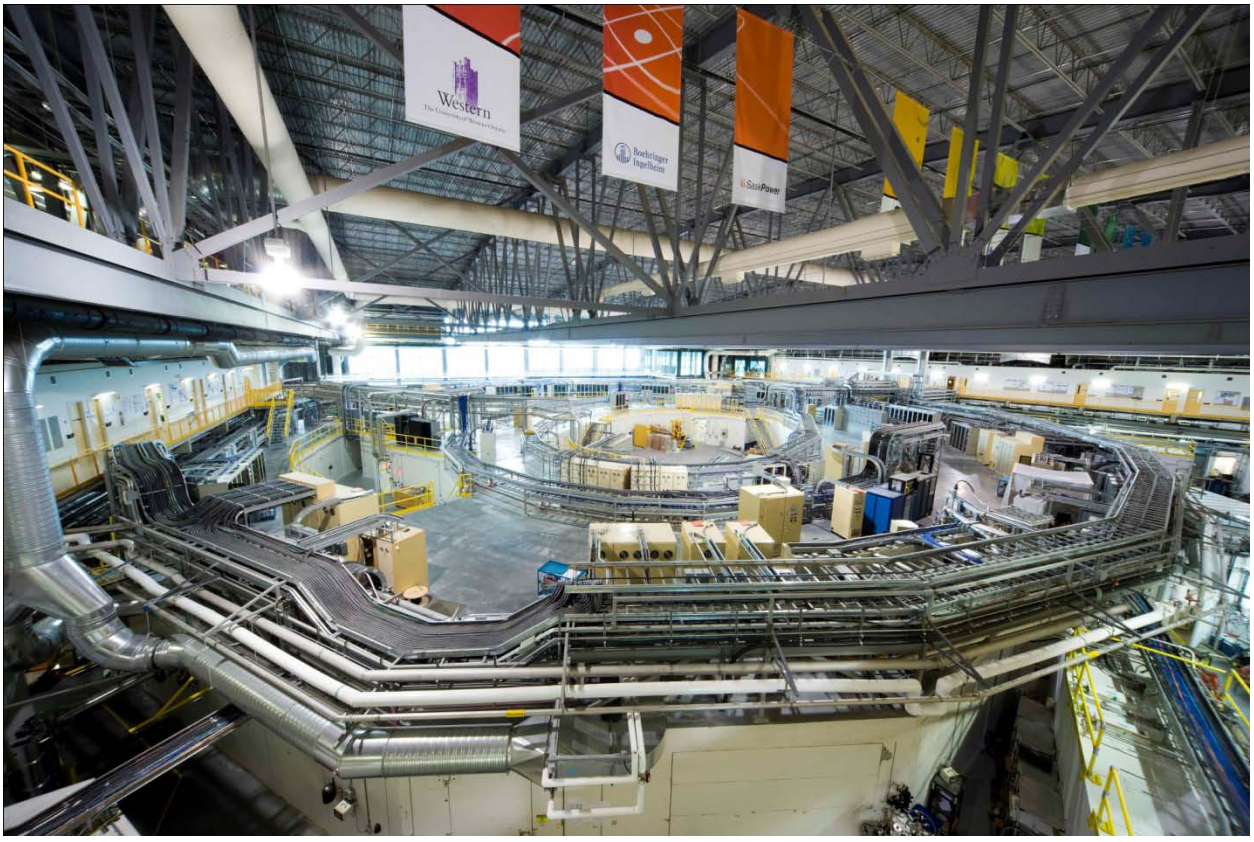


INTRODUCTION

The Canadian Light Source (CLS) is Canada's national synchrotron radiation facility located on the campus of the University of Saskatchewan, in Saskatoon. It is a powerful source of synchrotron radiation, primarily for the use of Canadian academic and industrial researchers from a broad range of unique scientific disciplines. Canadian Light Source Inc. (CLSI) operates the facility as a separate, non-profit company, wholly owned by the University of Saskatchewan.

In January 2010, the CLS Board of Directors approved *Building a World-Class User Facility for Synchrotron Light Experiments: The CLS Inc. Strategic Business Plan 2010 – 2013.* Developed by the senior management in consultation with CLS employees, users, clients and stakeholders, *The Strategic Business Plan* covers all aspects of the development and operations of Canada's synchrotron. It coincides with Industry Canada's present funding cycle for the facility's operating budget, ending March 31, 2013.

The plan consists of six strategic goals, with supporting objectives and deliverables:

- **Goal 1: Be a global centre of excellence in synchrotron-enabled research and innovation;**
- **Goal 2: Make the CLS the most responsive and valuable synchrotron light facility for industry;**
- **Goal 3: Maximize the performance and availability of the facility;**
- **Goal 4: Plan for CLS' Scientific future;**
- **Goal 5: Ensure the long-term sustainability of the CLS as a national facility; and**
- **Goal 6: Make CLS one of Canada's best employers.**

As part of the implementation of *The Strategic Business Plan*, the CLS is committed to regularly measuring and reporting progress made toward achieving the objectives under each of the strategic goals. This report highlights achievements and developments made towards each of the goals, as well as the plan's implementation during the 2009 – 2010 fiscal year.

The CLS Strategic Business Plan is a living document, the implementation and evaluation of which is an ongoing process as we work toward making it an integral part of the CLS corporate culture. As a living document, the plan will be regularly re-evaluated and revised as needed to respond to the needs and expectations of our users, clients and stakeholders, while also remaining open to seizing new opportunities that may present themselves.

PLAN IMPLEMENTATION

In accordance with section 5.4 of the plan, a staged approach was adopted to implement, measure and revise the strategic plan that started with the plan's adoption by the CLS Board of Directors in January 2010. Divided into three stages, this process culminates with the end of the first full planning cycle and delivery of a revised plan:

- Stage 1 (January – May 2010): Consisted of roll-out of the plan to managers and staff as part of an all-staff meeting, followed by roll-out and implementation by directors and managers to their respective departments, and the development of reporting mechanisms, culminating in a review and reporting of deliverables scheduled for completion by end of Fiscal Year 2010;

- Stage 2 (June – October 2010): Collection of initial staff feedback and measurement of deliverables; linking deliverables to the employee performance and planning review process by supervisors; a first pass revision of the strategic plan incorporating progress achieved on deliverables and lessons learned; and soliciting stakeholder feedback on the revisions, as well as quarterly progress reviews, and

- Stage 3 (December 2010 – March 2011): Compilation of the revised plan incorporating stakeholder feedback, presentation of the revised plan to the Board of Directors for approval.

PROGRESS REPORTS

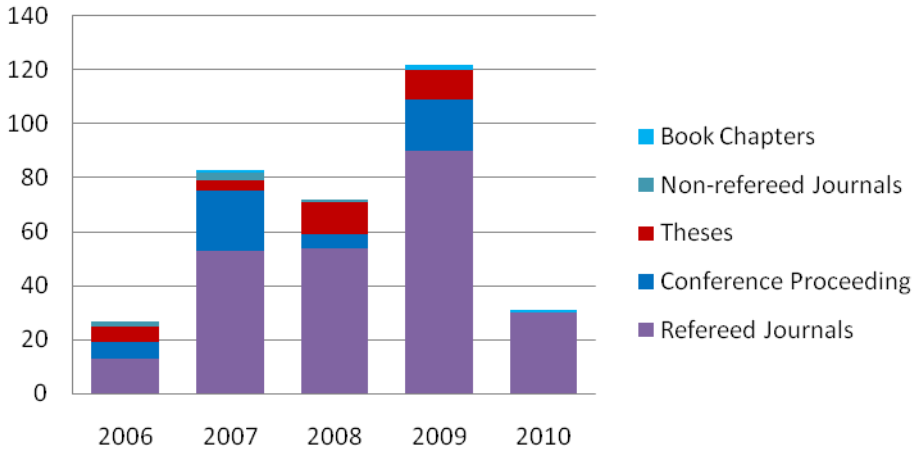
The following outlines the deliverables achieved and other significant developments made under each of the six strategic goals to 31 March 2010. A complete status report on each of the deliverables is attached as Appendix A. Together with the financial information and highlights included in Appendix B, this annual review is intended to provide a comprehensive overview of the achievements made towards implementing the *CLS Strategic Business Plan*.

STRATEGIC GOALS

Goal 1: Be a global centre of excellence in synchrotron-enabled research and innovation

The Canadian Light Source is at the leading edge of third generation medium-energy synchrotrons. All beamlines have been designed to be internationally competitive, while being optimized to the CLS machine parameters. Our goal is to have some beamlines recognized as being the best in the world in their area, as well as to have a full suite of powerful beamlines that are suited to the needs of the Canadian synchrotron community. The scientific activities at the CLS are focused in three research pillars: Materials and Molecular Science, Earth and Environmental Science, and Life Science. Encouraging the growth in the number of researchers in these areas as well as in new areas of research, ensuring that Canada's synchrotron is utilized to its fullest, are also a key to the success of this goal.

Goal 1: Be a global centre of excellence in synchrotron-enabled research and innovation	
Deliverable	**Development**
Full utilization of operational beamlines	Phase I beamlines 40 % oversubscribed
Increase staff for user support	Three full-time floor coordinators hired
Implement a graduate student travel support program	The graduate student support program has been announced; deadline for first applications in July 2010
One hundred scientific publications during 2010.	On track to achieving this goal by end of 2010.

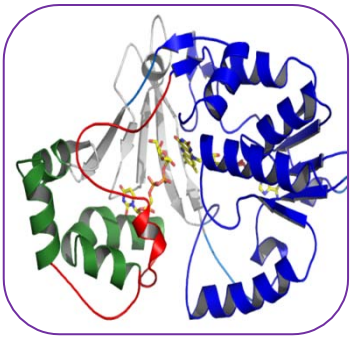


Publications by CLS users and staff to April, 2010

Recent Science Highlights

The following are some recent highlights of research reported by CLS users.

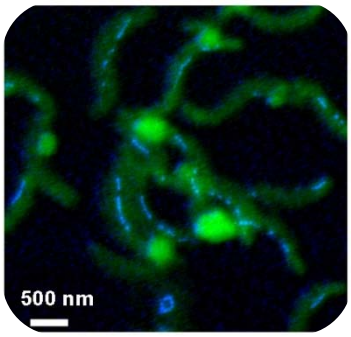
Health: Setting sights on new antibiotics



Bacterial infections once thought to be on the verge of eradication have been making a comeback, like Mycobacterium tuberculosis, the bug that causes tuberculosis. The rate of antibiotics resistance is on the rise as bacteria become resistant faster than we can come up with new drugs. The problem is compounded by the fact that new antibiotics are usually developed by modifying existing ones. Thus, bacteria that become resistant to an antibiotic often also become resistant to other drugs in the same class. University of Saskatchewan researcher David Sanders is trying to buck this trend. Using the Canadian Light Source, Sanders and his team are undertaking work that may lead to the development of an entirely new class of antibiotics to which no bacteria have resistance by targeting the building blocks of the bacteria's cell wall.

Reference: S.K. Partha, K.E. van Straaten, D.A.R. Sanders, 2009. Structural Basis of Substrate Binding to UDP-galactopyranose Mutase: Crystal Structures in the Reduced and Oxidized State Complexed with UDP- galactopyranose and UDP. *Journal of Molecular Biology*, 394(5), pp. 864-77.

Materials: Synchrotron takes bearing of nano magnets



Since the late 1960's, scientists have known that some bacteria make internal compasses by growing tiny magnetic crystals called magnetosomes. The bacteria use them to navigate, with cells of the same species growing crystals of uniform size, structure and out of the same magnetic minerals. Using the Canadian Light Source, researchers have for the first time been able to 'see' the magnetism of magnetosomes inside individual bacterial cells using the synchrotron's X-ray microscope. The finding sheds light on how magnetosomes grow in bacterial cells in response to genetic and environmental factors. Such understanding could be used by researchers to genetically manipulate the bacteria to grow magnetosomes that are tailor made for use in new kinds of data storage devices, nanomachines or delivery systems for cancer chemotherapy and other drug treatments.

Reference: Lam, K.P., et al., 2010. Characterizing magnetism of individual magnetosomes by X-ray magnetic circular dichroism in a scanning transmission X-ray microscope. *Chemical Geology* 270, pp. 110-116.

Environment: Making better use of agricultural leftovers

In developing countries, agricultural byproducts can be a source of serious environmental pollution. By recycling these byproducts into agricultural soils, these would-be pollutants can become sources of valuable nutrients, especially in tropical countries where a lack of available important plant nutrients such as phosphates are one of the major soil-related reasons for low per capita food production. In order to take full advantage of agro-industrial byproducts for soil amendment, detailed knowledge of the concentrations and availability of major plant nutrients including phosphate species is essential. With the Canadian Light Source, an international research team has shown that by-products of several crops including sugar cane and coffee are sources of agriculturally-useful phosphorous that could be applied to soils – utilizing a needed resource while reducing waste and the contamination of fragile ecosystems.

Reference: Negassa, W. et al., 2010. Phosphorous Speciation in Agro-Industrial Byproducts: Sequential Fractionation, Solution ^{31}P NMR and P *K*- and $L_{2,3}$-Edge XANES Spectroscopy. *Environmental Science and Technology* 44, pp. 2092-2097.

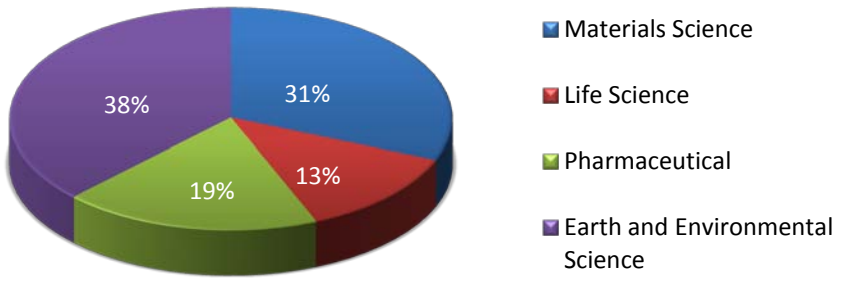
Goal 2: Make the CLS the most responsive and valuable synchrotron light facility for industry

A key component of the CLS' mission is to engage the industrial community to the highest degree possible. The CLS, as Canada's state-of-the-art synchrotron facility, provides unique capabilities to industry from a broad range of sectors. The innovative, client focused and solution-oriented approach of the CLS is paying off. During the 2009 – 2010 fiscal year, industrial utilization accounted for 12 percent of beam time (in comparison, industrial utilization at other synchrotrons accounts for 5 to 8 percent of beam time), with 16 companies having work performed at the CLS – the highest level of usage to date. The CLS Business Development and Industrial Science groups are hard at work to surpass these achievements by engaging new clients and fostering collaborative opportunities that link industry, academic researchers and the CLS.

Goal 2: Make the CLS the most responsive and valuable synchrotron light facility for industry

Deliverable	Development
Provide business-critical solutions	• 16 companies had worked done at the CLS during FY 2009-2010 • Industrial utilization is 12% of beam time
Identify, target and engage five new clients per year	Meetings with potential clients from the chemical, agrochemical and medical device sectors.
Complete and commission industry-focussed beamline	IDEAS beamline now under construction
Lead multi-partner research initiatives	Consultant hired to aid in development of Canadian Innovative Materials Research Centre (CIMRC)
Commence five new collaborative projects per year	Number of collaborative opportunities being pursued

Industrial activity at the CLS supports sectors that are key to the Canadian economy.



Industrial use at the CLS by industrial sector, FY 2009-2010

Recent Industrial Highlights

Recent examples of work performed for our clients in three industrial sectors include:

Environment: Steel manufacturer ensures environmental compliance

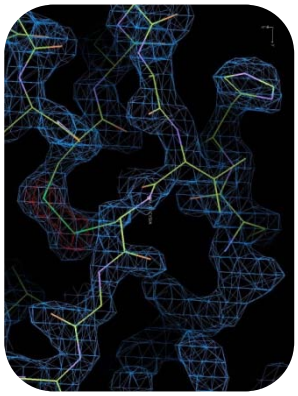
Evraz Inc. is one of the most diversified steel manufacturers in North America. With five plants in western Canada, the company recycles 1.2 million tonnes of steel per year. To ensure compliance with Environment Canada's Chemical Substances Management Plan, Evraz turned to the CLS to identify and quantify the vanadium and antimony oxides present in their products and by-products. The CLS was able to provide conclusive evidence of which products contained the oxides and at what levels. Evraz intends to use the CLS in future to assess materials against the federal government's new Domestic Substances List.

Materials: Greener protection for car engines

For over half a century, the oil additive ZDDP has been the motor oil industry's leading additive for preventing wear in automobile engines. However, the chemical reduces the efficiency of a car's catalytic converter thereby increasing exhaust emissions. For this reason, world energy giant Chevron is collaborating with the CLS to study the molecular structure of ZDDP in hopes of creating more environmentally friendly anti-wear additives that are as effective and inexpensive. Results of the research are not only helping to develop new products but also provide revolutionary insights into how lubricant additives protect against wear.

Reference: Zhou J.G., et al., 2010. Resolving the Chemical Variation of Phosphates in Thin ZDDP Tribofilms by X-ray Photoelectron Spectroscopy Using Synchrotron Radiation: Evidence for Ultraphosphates and Organic Phosphates. *Tribology Letters* 39, pp. 101-107.

Life Science: Structures for pharmaceuticals



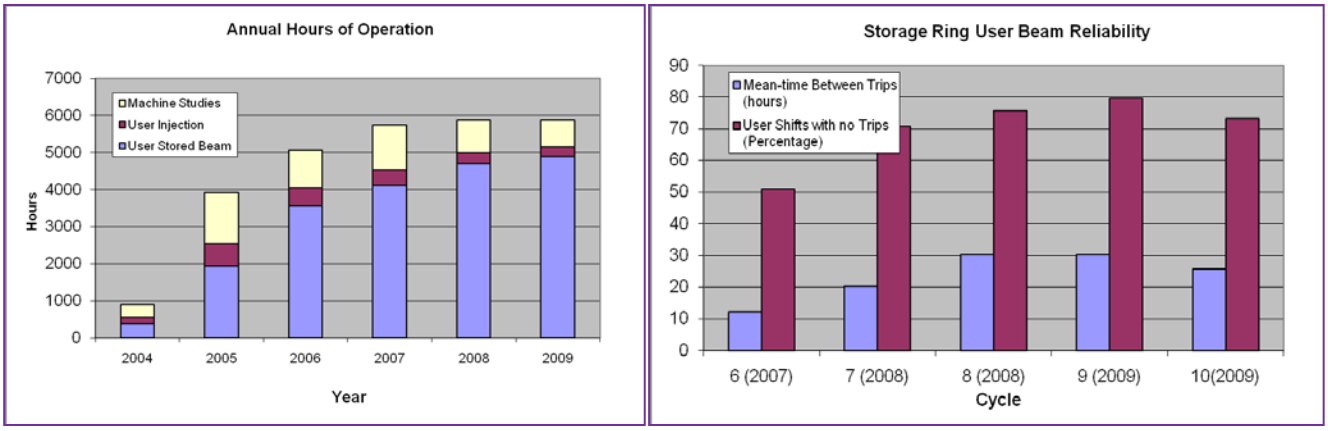
In their quest to produce new drugs, pharmaceutical companies rely on contract research organizations such as Shamrock Structures LLC of Illinois to do X-ray crystallography of drug target proteins on their behalf. A user of synchrotron facilities all over the world, Shamrock has found that the rate of data collection they achieve at the CLS is on par with, or better than, that obtained at other well-established facilities. But what impresses Shamrock the most is the business focused service they receive. "What the CLS does better than any other facility in the world, in my opinion, is they recognize that this is a business, and they make it price-competitive," says Richard Walter, Shamrock's Chief Scientific Officer. "That and the hard-working, dedicated, expert staff that maintains and runs their beamlines – that team is among the best!"

Reference: Walter, R.L. et al, 2010. High-throughput commercial protein XRD at the CLS: Strengths and Weaknesses of the CMCF Facility. *Canadian Light Source 2009 Activity Report*, pp. 150-151.

Goal 3: Maximize the performance and availability of the facility

Reliable operations of the accelerators and supporting systems that generate synchrotron light are vital to the success of the scientific programs and competitiveness the CLS. This includes ensuring that the facility operates 24 hours a day, seven days a week for most of the year, with a minimum number of system faults, and recovering from faults with a minimum disruption to users. In addition, the CLS must continually strive to improve the performance of its accelerator systems and optimize existing infrastructure.

Goal 3: Maximize the performance and availability of the facility	
Deliverable	**Development**
Increase accelerator availability	640 8-hour User shifts (477 uninterrupted shifts) were delivered in FY 09/10, up from 537 shifts (416 uninterrupted shifts) in 08/09.
Minimize recovery time between trips	Remains at slightly over 60 minutes. Injection times reduced to 13 from 17 minutes
New LINAC-LINAC-to-Booster Access Interlock Safety System	Installed and implemented in October 2009
Storage ring transverse feedback system	Online and running

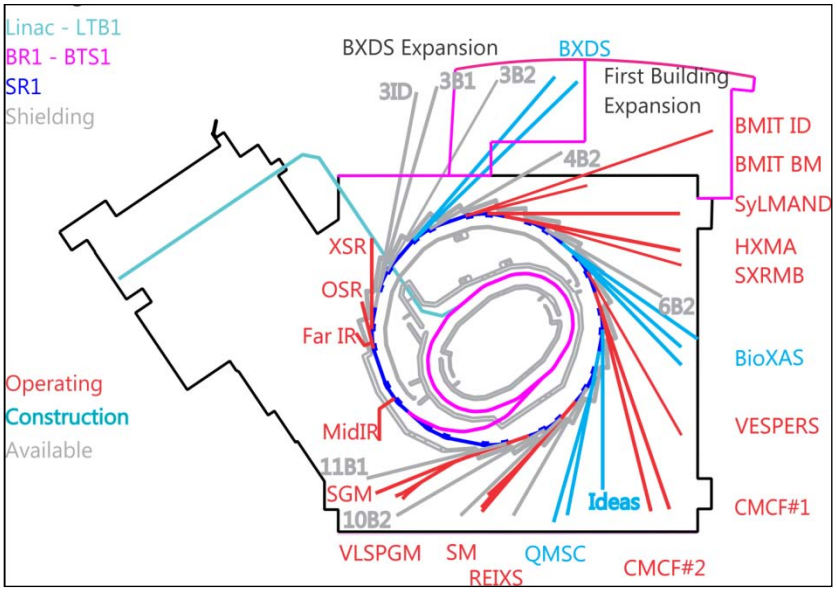


Summaries of annual hours of storage ring operations (left) and beam reliability (right)

Goal 4: Plan for the CLS' scientific future

In order to remain competitive with other synchrotron facilities around the world, the CLS must be able to accommodate new developments and developments in science. This includes considerations pertaining to current and potential infrastructure, the growth of the user community in both traditional synchrotron-using disciplines and new fields, and continuing to develop our capacity for innovation. Activity in this area to date has focused on examining the requirements to move the CLS to a 'top-up' mode for continuous electron injection into the storage ring in concert with the Operations Division, advancing efforts to mentor new Canadian users in coordination with the Experimental Facilities Division and Business Development Group, and acquire equipment for an enhanced X-ray development program.

Goal 4: Plan for the CLS' scientific future	
Deliverable	**Development**
Examine possibilities for machine upgrade	Established top-up working group, held first meeting. Goal for clear road map by May 1, 2011.
Canadian mentorship program	Senior user engaged to operate mentorship program at University of Alberta
X-ray instrumentation development program	Identified XSR beamline for installation of a Laue camera

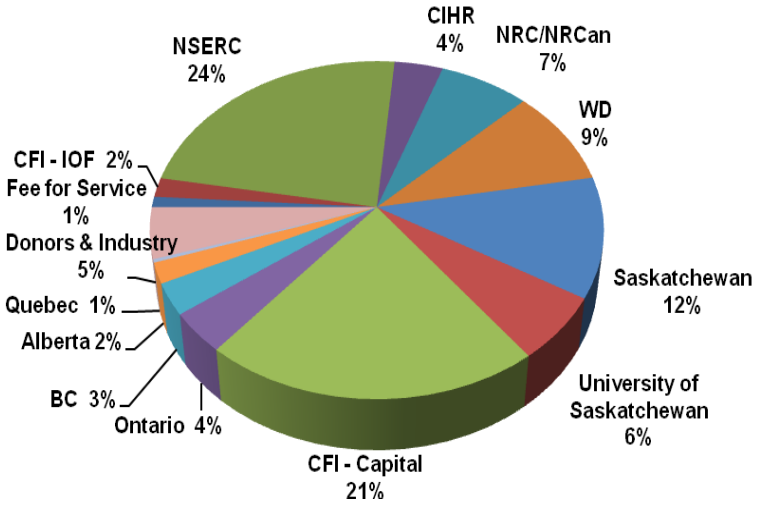


The CLS experimental hall, showing operating beamlines, facilities under construction and available ports for future beamlines.

Goal 5: Ensure the long-term sustainability of the CLS as a national facility

The CLS strives to be responsive and accountable to a number of constituencies in order to ensure its long-term viability and sustainability as a national facility. The objectives and activities within this goal include strategic communications, marketing and outreach activities to a number of audiences, including industry, academia, government and the public; as well as corporate processes to maximize accountability and manage risk. Together, these processes ensure that Canada's synchrotron earns a broad base of support from constituencies across the country and around the world by demonstrating relevance and return on investment.

Goal 5: Ensure the long-term sustainability of the CLS as a national facility	
Deliverable	**Development**
Engage key ministries and industries for stable funding	• Meetings held with key federal and provincial officials • Saskatchewan operating funding confirmed and announced in provincial budget
Seek support from industry	• Memorandum of Agreement negotiated with BioBusiness Alliance of Minnesota • Pursuing industrial collaborations for plant and animal imaging programs
Attract international collaborations	Presence at GLOBE 2010 and BIO 2010
Develop an enterprise risk management system	ERM process identified and being refined to meet the needs of CLS



CLS operational and capital funding to March 31, 2013

Goal 6: Make the CLS one of Canada's best employers

The staff of the CLS grew over 10 percent during the past fiscal year to 180 people, and is anticipated to grow to over 200 in the next three to five years as additional experimental facilities are constructed and come online. These positions are highly specialized, requiring the CLS to recruit and retain world-class expertise in science, engineering, information technology, instrumentation and design, as well as highly skilled trades people. To do so, the CLS is working to create an attractive working environment with a corporate culture that is responsive to the needs of our employees, encouraging their professional growth and development.

Goal 6: Make the CLS one of Canada's best employers	
Deliverable	**Development**
Employee opinion survey	Results of last survey shared with staff
Performance management systems; Individual professional development plans	Annual employee performance and planning reviews completed
Key HR policies	Policies completed relating to: Vacation, Anti-harassment, Code of Conduct, Hours of Work, Leaves of Absence, Professional Development

CLS staff, May 2010

NEXT STEPS

Much of the activity of the past fiscal year supporting *The CLS Strategic Business Plan* involved its development and introduction. With the completion of the first stage of the plan's implementation, efforts will focus on gathering feedback and lessons learned from our staff, users and stakeholders to facilitate revisions of the plan and its goals. Efforts will also continue to prioritize and progress the deliverables within each of the six goals, including:

- Completion of the commissioning of the facility's Phase II beamlines by the end of 2010;
- Encourage formal and working collaborations between industry and researchers from academic and government research institutions through continued engagement with the user community and our clientele;
- Make progress towards the construction of new office and laboratory spaces and an expansion to the facility;
- Development of a scientific plan for the last unoccupied section in the storage ring;
- Organizing workshops to explore new research opportunities and attract new users and customers;
- Develop informational approaches to quantify research relevant to industry
- Implement the Enterprise Risk Management system; and
- Completion of a comprehensive review of job descriptions and compensation levels, while also striving to improve employee communications.

CONCLUSION

The CLS Strategic Business Plan is a living document that is becoming an integral part of the way business is done at Canada's synchrotron. The plan is a road map to which the CLS is committed as we strive to be recognized as a global leader in synchrotron science and its applications while advancing Canadian science, enhancing the competitiveness and innovation of Canadian industry, and contributing the quality of life of Canadians and people around the world.

APPENDICES:

Appendix A: Summary of deliverables and status to 31 March 2010

Appendix B: Comparison of actual to projected expenditures

Appendix A: Summary of Deliverables and Status to 31 March 2010

GOAL 1: BE A GLOBAL CENTRE OF EXCELLENCE IN SYNCHROTRON-ENABLED RESEARCH AND INNOVATION

Sponsor: Director of Research

Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Full utilization of Phase I beamlines	Director of Research, Assistant Director of Research and Phase I Beamline Scientists	Started	End of 2010	In progress	We are very close. For Cycle 12 (July-Dec 2010) there were requests for 1306 General User shifts. Only 722 shifts were initially available, but we were eventually able to allocate 944 shifts (40% oversubscribed).
>100 Publications in 2010	Director of Research, Assistant Director of Research and Beamline Scientists	Jan 2010	Dec 2010	In progress	Being tracked
Outreach	Executive Director, Director of Strategic Scientific Development, all EFD	Started	Ongoing	In progress	Presence at CSC, CAP and XVUV 2010.
Travel grant program	Executive Director, CFO, Director of Research	Discussions: November 2009	Implement: July 2010	In progress	The Graduate Student Travel Award program was announced: http://www.lightsource.ca/uso/travel_award.php It will become active as of July 2010.
Mentorship program	Executive Director, Director of Strategic Scientific Development, Director of Research	2010	2012	In progress	A senior user has begun mentoring new users, on a test basis. First mentored users have done experiments.
Complete Phase II scientific commissioning	Assistant Director of Research and Phase II Beamline Scientists	Started	End of 2010	In progress	On track. Target should be met with the exception of BMIT-ID beamline and some Phase II endstations.
Phase III, and IV	Project Manager, Director of Strategic Scientific Development, Director of Research	Starting	2013	In progress	Bio-XAS progressing well. QMSC delayed about 4 months due to changes in design. Brockhouse moving forward. SGM and VLS-PGM upgrade approaching budget finalization.

Appendix A: Summary of Deliverables and Status to 31 March 2010

Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Experimental facility improvements and upgrades	Director of Strategic Scientific Development, Director of Research, Executive Director, SAC and Board	Started	Ongoing	In progress	The 2010/11 budget contains $50k/beamline for beamline improvements and $2M for major capital projects, but this is not maintained in future years, which is a concern. The Life Sciences Lab is progressing but no funding has been committed for the Small Animal Preparation Lab. The Board approved IDEAS beamline is currently under construction, and will progress significantly in 2010/11.
Future CFI proposals	Director of Strategic Scientific Development, Director of Research, Executive Director, SAC and Board	December 2009	Submit proposals December 2010	Not started	The CFI has delayed the Call for Proposals, so the December 2010 date is no longer valid although the University of Saskatchewan had a call for EOIs. Two new beamlines have been proposed, and two upgrades were submitted (the SM beamline and the facility).
Workshops	Director of Strategic Scientific Development, Director of Research	Jan 2010	Dec 2010	In progress	Two workshops have been proposed by the UAC, one in the Ottawa area, and one on the west coast. Additional workshops are planned to coincide with annual meetings of the Canadian Institute for Neutron Scattering and the Canadian Association of Physical Anthropologists.
User feedback system	Assistant Director of Research and Services Office	10 times per year	ongoing	In progress	As planned
User feedback results	Director of Research	Yearly	Year 1: upgrade rooms in Lutheran seminary, improve eating facilities and quiet areas, add roof to SM area.	In progress	The rooms have been upgraded in the Lutheran Seminar (new beds, chairs, phones and internet in all rooms). Other improvements will be put on hold as there is pending news concerning a better alternative to the Lutheran Seminary. Food services have been improved with the recent new service being offered by a local restaurant. Expanded space for eating and quiet areas are proposed as part of the project to develop the second floor of the BMIT expansion. The roof over the SM area has been approved and construction plans are underway.

Appendix A: Summary of Deliverables and Status to 31 March 2010

Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Staff for user support	Executive Director	2009	2013	In progress	Three full-time floor coordinators have been hired. However, the Strategic Plan calls for an increase of staff to support users to 70, and an average of 3 staff per beamline. This is not currently supported in the CLS Staffing Plan.
UAC meetings	Director of Research and User Services Office	Monthly by teleconference, 2 face-to-face at the CLS	ongoing	In progress	As planned
UAC advice	Assistant Director of Research		April 2010	Completed	This refers to the full-time Floor Coordinators. The first 3 were hired in March 2010.
AUM	UAC & User Office	Yearly in June	ongoing	In progress	As planned. http://www.lightsource.ca/uac/meeting2010/index.php
Summer School	EFD	Yearly in June	ongoing	In progress	As planned. This year's school (June 13-18) is significantly oversubscribed: http://www.lightsource.ca/education/summerschool/
BAC meetings	Director of Research	Monthly	ongoing	In progress	As planned
In-house research grants	Executive Director and Director of Research	2009	ongoing	In progress	Budget for 2010 needs to be clarified. It is not currently sufficient.
CLS Graduate students and joint faculty positions	Executive Director, Director of Research and Director of Strategic Scientific Development	2010	ongoing	In progress	The current staff plan supports 4 graduate students by 2011. One is in place.
'School of Synchrotron Science' U of S	Director of Research	started	Launch Spring 2010	In progress	Planning has started at the University of Saskatchewan, but has not moved forward in recent months.
User stats	Director of Research, Assistant Director of Research and User Office	Ongoing	Spring SAC Meeting each year	In progress	Ongoing
Science highlights	Communications Coordinator	Monthly	Monthly/ Annual	In progress	Ongoing

Appendix A: Summary of Deliverables and Status to 31 March 2010

Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Activity Report	Communications Coordinator	Yearly	June each year	In progress	Activity Report is complete, and in the final proof stage.
SAC Meetings	Executive Director and Director of Research	Twice per year	Ongoing	In progress	The Spring 2010 SAC Meeting will be held May 13-14
Mid-Term Review	Senior Management, Director of Research to coordinate	2010	Date in 2011 to be determined	Not started	Planning to start in the second half of 2010
University - CLS collaborations	Executive Director	June 2009	Ongoing		On-going.
Collaborative projects	Director Technical Support	June 2009	Ongoing		Current collaborations with Stanford in the development of components related to the BioXAS beamline. Also working with Brazil on possible collaboration on Brockhouse project.
Workshops	Executive Director	January 2010	Ongoing		Several concepts of workshops in progress including: greener mining using synchrotron radiation, 3d Histology, neutron therapy: research reactors and synchrotrons in cooperation, concepts in minimally invasive research therapies, and spectroscopic imaging in plant genetics. Held laser backscattering workshop.

GOAL 2: MAKE THE CLS THE MOST RESPONSIVE AND VALUABLE SYNCHROTRON LIGHT FACILITY FOR INDUSTRY

Sponsor: Director of Industrial Science

Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Realize annual revenue projection by fiscal year 2012/13	Director of Industrial Science, Director of Business Development	Started	April 2013	In progress	Developing list of target companies within primary target sectors as outlined in the Business Development Business Plan . Identifying new target sectors such as agriculture.
Provide business critical solutions to our clients	Director of Industrial Science	Started	Ongoing	In progress	Completed reports for a number of clients including new and repeat customers.
Identify, target and engage five new clients per year	Director of Industrial Science, Director of Business Development	Started	Ongoing	In progress	Working at engaging a number of new companies within various sectors which may have interest in the capabilities of the CLS. Have developed a list of companies and their needs within the aerospace sector as part of our Boeing partnership.
Implement a marketing and communication plan	Director of Industrial Science, Director of Business Development	Started	Ongoing	In progress	Currently identifying new sectors for the creation of new marketing material. Plan on re-visiting current marketing and communication material to determine value and impact in order to determine if current plan as discussed in the business development business plan needs to be updated.
Execute a client feedback mechanism	Director of Industrial Science	Started	June 2010	In progress / completed	Survey has been developed for client feedback. Developing mechanism to optimize feedback from clients. Completion rate is very low.

Appendix A: Summary of Deliverables and Status to 31 March 2010

Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Conduct annual BDAC meetings	Director of Industrial Science and Director of Business Development	Yearly in February	Ongoing	Completed for 2010	Meeting occurred in February 2010. A number of recommendation and comments were developed around industrial engagement including: • Issues around the strategic and business plan • Marketing • CIMRC (Boeing partnership) • Engaging SMEs • Industrial presence on the Board • Human resources.
Match the capabilities of CLS infrastructure and associated applications with target sectors	Director of Industrial Science and Industrial Science group	Started	Ongoing	In progress	Developing a series of matrices that match CLS capabilities with technology gaps in various sectors. Initially looking at energy storage, mining and aerospace.
Create new marketing materials focusing on four industrial sectors per year	Public Relations and Marketing Cooridnator	Started	Ongoing	In progress /not started	Attempting to identify new sectors, such as energy storage and agriculture which will require new marketing materials. Have not yet begun developing new marketing material.
Identify, engage and conduct five demonstration projects for new clients per year	Director of Industrial Science, Director of Business Development	Started	Ongoing	In progress	In discussions with Nova Chemicals on potential projects on catalysts along with working with an academic researcher who has strong industry ties with the nuclear sector.
Implement a yearly trade shows plan	Marketing and Public Relations Coordinator	Yearly in October	Ongoing	In progress	Have completed our bi-annual meeting (February 2010) on conference and trade shows to attend. Attempting to quantify the impact of attending these events and determine the number of clients and prospects that can be directly related to our presence at a tradeshow.

Appendix A: Summary of Deliverables and Status to 31 March 2010

Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Complete and commission an industry focused beamline (IDEAS)	Executive Director, Director of Research, Director of Industrial Science and Director of Technical Support	Ongoing	December 2010	In progress	Installation of several components complete and still on track for December 2010 start of commissioning.
Lead multi-partner research initiatives including Canadian Innovative Materials Research Centre (CIMRC)	Director of Industrial Science, Director of Business Development, CFO	Ongoing	December 2010	In progress	A consultant has been engaged to develop an industrial engagement plan. The scope of CIMRC has been expanded through discussions with Boeing to include paints and coatings. A post-doc is being considered between the CLS and the Univ. of Virginia to look at novel alloys as a part of product development for the centre.
Initiate academic and government research fee-for-service beamtime rates for collaborative projects	Director of Industrial Science and Director of Business Development	Started	June 2010	In progress	Reduced rates are discussed in the Business Development Business Plan. Not currently rolled out to the academic or government communities.
Develop and implement a plan to encourage the user community to purchase beamtime for projects in which industry is funding some of the work	Director of Industrial Science, Director of Business Development and Director of Research	Started	December 2010	In progress	Have discussed with a number of academics the idea of buying some time for projects which have a strong industry partnership. One recommendation has been that this could be part of an NSERC CRD proposal with purchased beamtime as part of an industry contribution.

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Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Create a mechanism by which industrial scientists may obtain beamtime and required resources to facilitate research programs	Director of Industrial Science		June 2010	In progress	Industrial science group has commenced a research project with a strong industry flavour on nanomaterials. Looking at a mechanism to get experimental time for this project that may be part of the industry time and not significantly impacting experimental time available for clients.
Commence five new collaborative projects per year	Director of Industrial Science	Started	Ongoing	In progress	Discussion with companies on collaborative projects. Several of these collaborative projects may begin as a fee-for-service analytical projects that may evolve into something more significant. None currently in place.
Develop a method to report to the user community on the industrial program and its achievements	Director of Industrial Science and Director of Research		June 2010	Not started	Looking at discussing at the CLS annual users' meeting which occurs in June.
Send a letter to the user community outlining the importance of reporting industrial utilization	Director of Industrial Science, Director of Business Development and Chair of the UAC		March 2010	Completed	Letter sent on early March 2010. Survey of current industry utilization by the academic community is ongoing.
Make a clear statement about CLS guidelines on industrial utilization	Director of Industrial Science and Director of Research		March 2010 September 2010	In progress	CLS guidelines have not been formally drafted on industry utilization. 25% industry availability per beamline was approved by the CLS Board of Directors in March 2010. Discussed informally with a number of academic partners.

Appendix A: Summary of Deliverables and Status to 31 March 2010

Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Initiate academic and government research fee-for-service beamtime rates for collaborative projects	Director of Industrial Science and Director of Business Development	Started	June 2010	In progress	Reduced rates are discussed in draft Business Development Business Plan. Not currently rolled out to the academic or government communities. Will be part of the CLS guidelines for industrial utilization.
Develop robust commercialization systems and strategies to accommodate industry usage and investment	Director of Business Development	Ongoing	2010-11	In progress	Looking at developing IP positions around various techniques developed at the CLS that could have some industrial relevance.
Engage internal staff to support industrial awareness and mandate	Director of Business Development and Director of Industrial Science	Ongoing	2011	In progress	Inform the internal staff on the importance of the industrial program. Planned for an upcoming experimental facility division meeting. Have commenced a process to invite in-house research staff to meetings with potential industrial partners in order to get their input and engage them in various projects.

GOAL 3: MAXIMIZE THE PERFORMANCE AND AVAILABILITY OF THE FACILITY

Sponsor: Director of Accelerators

Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Increase accelerator availability – Operate 24/7 for significant portion of each year	Director of Accelerators; Accelerator Operations Manager	Ongoing		In progress	640, 8-hour User shifts (477 uninterrupted shifts) were delivered in FY 09/10, up from 537 shifts (416 uninterrupted shifts) in FY08/09.
Ensure accelerator system operates reliably	Director of Accelerators; Accelerator Operations Manager	Ongoing		In progress	Average reliability dropped in FY09/10, with a mean-time between trips of only 27 hours, down from 34 hours in FY08/09. The drop was largely caused by vacuum problems during Run 57 and water problems during Run 58. Both issues have now been resolved.
Minimize recovery time between trips.	Director of Accelerators; Accelerator Operations Manager	As needed (Annual		In progress	Recovery time after a trip remains at slightly over 60 minutes. However, injection times have been reduced from typically around 17 minutes in 2009 to around 13 minutes in early 2010.
Increase beam stability	Director of Accelerators; Accelerator Operations Manager	2009	2012	Not started	Delayed. The upgrade of orbit correction power supplies to implement faster global orbit correction was delayed because of failures of 3 new power supply boards. These have been returned to the manufacturer for repair.
Increase average current	Director of Accelerators; Accelerator Operations Manager; HSE Manager	2010	2012		The 2 main ways that we would look at increasing current are by going to top-up operation, or by increasing the fill to approximately 500 mA, or both. We are currently looking at pursuing top-up operation, with the time frame for implementation in 1 to 2 years.

Appendix A: Summary of Deliverables and Status to 31 March 2010

Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Reduce beam emmitance	Director of Accelerators; Accelerator Operations Manager	2010	2012	Not started	
Implement asset management system	Director of Accelerators, Director of Technical Support	2010	2013	In progress	Work request process operating in Technical Services and Experimental Facilities, but required additional work for full implementation. Review of commercial maintenance packages awaiting final decision. Maintenance plan document under review.
Develop laboratory and support infrastructure	Director of Technical Support; Engineering Technical Services Manager	2010	2013	In progress	Offices in Phase II expansion: design started, construction completion expected in early 2011. Tenders ready for life sciences lab once insurance issues are finalized. Hold on the cleanroom/cleaning room. Washroom shower area near BMIT is ready to convene design team. Brockhouse expansion is ready to award RFP shortly.
Upgrade and enhance electrical and mechanical services	Director of Technical Support; Engineering Technical Services Manager	2010	2013	In progress	Space cooling added to mechanical basement. Installed new power distribution to mechanical basement and for future beamlines. Major 25 kV switchgear maintenance completed. Redundant power feed for facility confirmed.

Appendix A: Summary of Deliverables and Status to 31 March 2010

Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Support the IT needs of the scientific program and CLS staff	Information Communications Technology Manager, Controls and Instrumentation Manager	Ongoing		In progress	Ongoing system upgrades

GOAL 4: PLAN FOR THE CLS' SCIENTIFIC FUTURE

Sponsor: Director of Strategic Scientific Development

Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Develop a scientific plan for the last straight section	Director of Strategic Scientific Development	January 2010	January 2011	IP with target of July, 2010	There are three currently identified areas for consideration: 1) single chair concept for minimally invasive treatment of disease using X-ray imaging, X-ray therapy, electron-therapy and proton therapy, together with advanced facilities for drug development and testing; 2) targeted imaging (with spectroscopic imaging) of plants to be considered for molecular farming; 3) green mining with advanced radiological handling capability and trace element detection and spectroscopic imaging. Each of these three candidate areas will be developed, with other potential areas. Criterion for consideration is that each proposal must be "strong enough" to also deliver the required non-beamline infrastructure at the CLS.

Appendix A: Summary of Deliverables and Status to 31 March 2010

Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Develop an infrastructure and upgrade proposal for CLS	Director of Strategic Scientific Development	January 2010	November 2010	In progress	EOI was submitted to University of Saskatchewan internal CFI review group, and was successful. CLS was asked to develop a proposal for the next CFI round, based on this EOI.
International mentorship program	Science Directors (Industrial Science, Research, Strategic Scientific Development) and Executive Director	Started	Ongoing	In progress	Have made several trips to the United States to engage and mentor potential new users.
Canadian Mentorship program	Science Directors and Executive Director	Started	Ongoing	In progress	Have engaged a senior user to begin mentoring new users in the soft X-ray area; first users have completed experiments under this program.
Examine all possibilities for future machine upgrade	Director of Accelerators, Director of Strategic Scientific Development	January 2010	July 2011	In progress	Consultation process has begun with experts from other synchrotrons (and CLS) to identify and give direction to potential upgrades to the core facilities.
Hold laser and fast timing workshop	Director of Research, Director of Accelerators, Director of Strategic Scientific Development	December 2009	December 2010	In progress	Have had initial discussions with a member of the Advanced Laser Light Source to define areas of joint interest and determine timing and scope of a workshop.
Create a theory group in support of user and mentorship programs	Director of Strategic Scientific Development, Director of Research, Executive Director	During 2010	On-going	In progress	Working with U of Saskatchewan College of Arts and Science to assess potential for a joint CLS/U of S Canada Research Chair (Tier 2) in soft condensed matter theory.
X-ray instrumentation development program	Director of Strategic Scientific Development	During 2010	On-going	In progress	Working to implement (for the first time anywhere in the synchrotron world) an enhancement to beamline controls so the impact of an optical change can be compared (in real time on the API) with the simulated impact of that change. Also working to develop a novel aberration correction mirror system based on X-ray lithographic techniques.

GOAL 5: ENSURE THE LONG-TERM SUSTAINABILITY OF THE CLS AS A NATIONAL FACILITY

Sponsors: Director of Business Development and Chief Financial Officer

Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Engage key government ministries and agencies for stable funding strategy	Director of Business Development; Public Relations and Marketing Coordinator	Ongoing	2011	In progress	Meetings held with key federal ministers and provincial ministers in fall 09/winter 10
Build political momentum	Executive Director, Director of Business Development, Communications, PR/Marketing	Ongoing	2011	In progress	Saskatchewan operating funding contribution confirmed and announced in Provincial Budget
Seek support from industry	Director of Business Development, Director of Industrial Science	Ongoing	2012	In progress	Numerous meetings with companies have been held. Pursuing industrial collaboration for imaging program for plant genomics research.
Engage granting councils, NRC, Industry Canada	Director of Business Development	Ongoing	Ongoing	In progress	Several meetings have been held with Industry Canada and NRC representatives. Meetings with granting councils are scheduled. In addition, granting council reps participate in CLS Scientific Advisory Committee meetings.
Promote the value and societal impacts of synchrotron R&D	BD all	Ongoing	Ongoing	In progress	Continuously performed through various tools including: public tours, presentations, website, science highlights, and brochures.
Attract international collaborators	Director of Business Development, Director of Research	Ongoing	2013	In progress	CLS scientists continuously participate in international scientific conferences to increase CLS profile
Develop informational	Director Business Development	2009	2010-11	In progress: anticipate	New informational instruments have been developed and will now be put in use.

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Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
approaches to quantify industrial relevant research	(with CFO and Director Industrial Science)			completion Q4 2011	
Promote involvement of educators and researchers as well as government and community agencies in support of CLS educational initiatives.	Outreach Coordinator	Ongoing	Ongoing	In progress	Delivered multiple presentations at education and community conferences; Initiated collaboration with national science centre
Manage national programs to engage high school students across Canada	Outreach Coordinator	Ongoing	Ongoing	In progress	Seven groups of high school students participated in "Students on the Beamlines" program; video conferencing capacity is under development
Develop and deliver annual training programs to educators to solicit participation of their students' in CLS activities	Outreach Coordinator	Annually	Ongoing	In progress	CLS hosting Canada's second "Science on Stage" national meeting of science educators
Provide tours and presentations to multiple audiences on and off-site	Outreach Coordinator	Ongoing		In progress	4,500 tour participants in 2009, and over 25 presentations delivered by the outreach team alone
Manage and conduct crisis communications	Communications Coordindator	Ongoing	2011	In progress	Draft crisis communications plan is under review

Appendix A: Summary of Deliverables and Status to 31 March 2010

Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Plan and conduct successful events (workshops; press conferences, etc)	Communications, PR-Marketing Coordinators	Ongoing		In progress	Continuously organize press conferences, workshops, meetings, summer school etc
Develop and implement strategic branding plan	PR-Marketing Coordinator	Ongoing	2011	In progress	Branding guidelines are under development
Conduct media relations to publicize CLS successes and achievements	Communications Coordinator	Ongoing		In progress	Media releases and advisories are produced as needed; science highlights sent to media as produced (monthly)
Produce informational/marketing products targeted to public, academia, and industry	BD all	Ongoing		In progress	Continuously produce materials for different audiences, as needed
Conduct internal communications to inform and involve staff in achieving CLS objectives	BD all	Ongoing		In progress	Created new feature for monthly staff newspaper; management held internal communications feedback session
Manage Website promoting all CLS services and activities	PR-Marketing Coordinator	Ongoing		In progress	Continuously updated to stay current by team of 15 administrators (average 5 changes/day)

Appendix A: Summary of Deliverables and Status to 31 March 2010

Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Engage current and new stakeholders with creative opportunities to solicit new funding for capital projects	Development Coordinator *[not staffed]*	2009	2011	In progress	Continuing discussions with current and new stakeholders to solicit funding for existing and future potential capital projects
Develop donor/funder recognition policy	Development Coordinator *[not staffed]*	2009	2011	In progress	Draft stakeholder recognition guidelines are under review
Consider the option of creating a foundation	Development Coordinator *[not staffed]*	2009	2011	Not started	
Develop key industrial collaboration – CIMRC business plan	Director Industrial Science	Nov 2010	Feb 2011	In progress	A consultant has been engaged to develop an industrial engagement plan. The scope of CIMRC has been expanded through discussions with Boeing to include paints and coatings. A post-doc is being considered between the CLS and the Univ. of Virginia to look at novel alloys as a part of product development for the centre.
Participation of stakeholders in Midterm review	Executive Director	June 2010	November 2010	Not started	
Present a strategy to develop an ERM system to senior management and the Audit Committee of the Board	CFO	January 2010	February, 2010	In progress	Planned approach discussed at March meeting of the Audit Committee. Directive of the Committee to bring overview of ERM plan to next meeting in June 2010.
Identify strategic / enterprise risks	CFO	March 2010	August 2010	In progress	Met with the University of Saskatchewan rep and consultant to review plan and develop strategy forward. No detailed review yet.

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Action	Lead	Start Date	Anticipated Completion	Current Status	Comments
Identify strategies to mitigate and prioritize risks	CFO	September 2010	October 2010	Not started	Working with University of Saskatchewan and consultant to tailor an ERM plan.
Present ERM To audit Committee & Board of Directors	CFO	December 2010	December 2010	Not started	
Ongoing review and evaluation	CFO	Ongoing quarterly	Ongoing quarterly	Not started	

Appendix A: Summary of Deliverables and Status to 31 March 2010

GOAL 6: MAKE THE CLS ONE OF CANADA'S BEST EMPLOYERS

Sponsor: Chief Financial Officer

Action	Description	Lead	Anticipated Completion	Current Status	Comments
Complete update of Job Evaluation (JE)	- Review of all position descriptions every 2 years - Re-evaluation of "hot" positions for reclassification - Documentation completed - Communication to staff and managers	HR	March 31/10	In progress	HR conducted an extensive review of all Out of Scope job descriptions to ensure consistency from an organizational perspective, within job families and within departments. Awaiting input from Managers/Directors to finalize in order to provide to staff. Expected completion June 2010.
Review of salary survey data and adjust CLS Salary Grid to market	- Analysis of market data from salary surveys - Adjust CLS grids to match compensation strategy - Every 2 years and prior to re-negotiation of Collective Agreement	HR	Salary surveys have been purchased and are currently being utilized to update salary grids. Expected completion May 2010	In progress	Salary surveys have been purchased and are currently being utilized to update salary grids. Expected completion May 2010
Employment Equity		HR	Annually June 1 /10 for reporting June 30/10 for training	June 2010	Deliver two workshops annually (currently under development) that meet CLS' mandate under Employment Equity Legislation Meet CLS' reporting obligations

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Action	Description	Lead	Anticipated Completion	Current Status	Comments
Recruitment	Document recruitment / selection processes	HR	September 2010		
Internal Communication Plan	- Monthly meetings between HR and Management to discuss HR related issues - Develop the CLS team site to communicate HR policies, programs, special issues - Regular meetings with CEP every 2 months	HR	March 31, 2010	Completed	Meetings held as required. HR regularly attends Operations Meetings (weekly) Several new documents included on teamsite Regular new employee orientation meetings held, to introduce new staff to various departmental processes. Regular meetings with CEP held (at least every 2 months) and as required HR regularly contributes to Enews (external) and In the Loop (internal) publications.
Key HR Policies		HR	Reviewed and modified as required September 2010		Completed documentation of HR policies relating to Vacation, Anti-Harassment, Code of Conduct, Hours of Work, Leaves of Absence, Professional Development Drafted policies for review by September 2010 include: Vacation policy Anti-Harassment Policy Hours of work Professional Development

Appendix A: Summary of Deliverables and Status to 31 March 2010

Action	Description	Lead	Anticipated Completion	Current Status	Comments
Employee Opinion Survey		HR	Annually		Results of last survey provided to all staff in January 2010; each department has met with staff to further discuss and provide additional feedback for follow-up. Next planned survey is September 2010
Organizational Chart		HR	As required		As part of the review of Job descriptions, undertaken review of the structure within which the positions fall into the organization To be discussed with management before June 30, 2010; subsequently communicated to staff.
Personnel Plan	- Implementation of long and short term goal setting at the department level - Defined personnel needs at the department level, with reference to key CLS objectives - Reviewed annually	Directors CFO	March 31, 2010	Completed	Positions identified as part of budgeting process in February 2010; budget restraints have limited ability to meet all needs; to be re-reviewed in May 2010
Work Order Plan	Implementation of work planning & communication tools Training for managers and supervisors	Directors	Sept 2009	Sept 2011	
Leadership Development	Delivery of one internal supervisory / leadership training program annually	HR	Set up by June 2010	In progress	Management training sessions planned in April and May for supervisors, managers and project leaders. Coaching sessions to be set up for directors.

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Action	Description	Lead	Anticipated Completion	Current Status	Comments
Performance Management Systems	Performance Planning and reviews completed for all out of scope employees	HR	September 2009	April 2010 (Annually)	
Individual PD Plans		HR	Annually, next due April 30, 2010		Part of the performance planning process

Appendix B: Comparison of Actual to Projected Expenditures

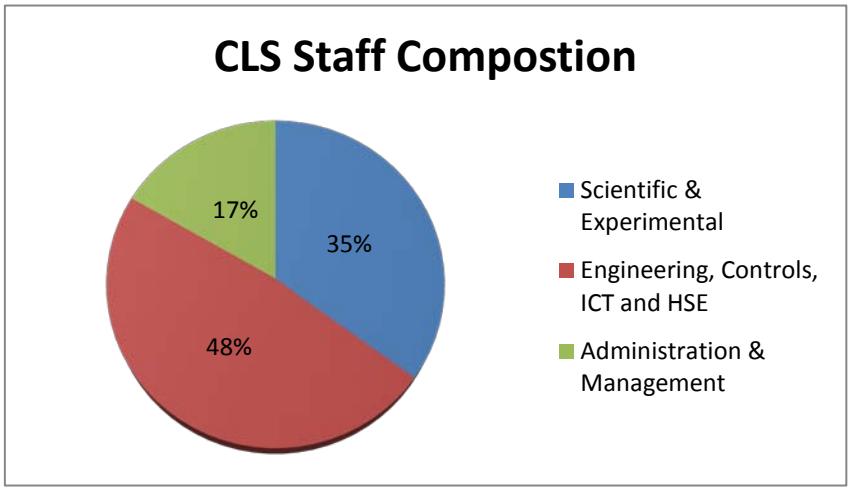
COMPARISON OF ACTUAL EXPENDITURES TO PROJECTED EXPENDITURES (IN $ THOUSANDS) FOR THE YEAR ENDED MARCH 31, 2010

	ACTUAL	PROJECTED
# of Beamlines Operating/Commissioning	*12*	*13*
# of Beamlines Under Development	*9*	*9*
# of Personnel	*174*	*180*
Revenues		
Major Resources Support grant	$ 20,863	$ 27,600
Infrastructure Operating Fund (CFI)	218	250
Western Economic Diversification	2,280	1,180
Province of Saskatchewan	-	-
Fee-for-service	566	1,030
University of Saskatchewan	3,146	3,146
Total Revenues	$ 27,073	$ 34,797
Expenditures		
Salaries and benefits	$ 12,789	$ 16,182
Maintenance	6,223	5,772
Supplies and services	3,171	3,116
Licenses, including utilities	2,291	2,850
Decommissioning costs	341	352
Equipment & capital enhancements	2,651	6,420
Total Expenditures	$ 27,466	$ 34,692
Excess (Deficiency)	**$ (393)**	**$ 105**

Appendix B: Comparison of Actual to Projected Expenditures

1. Salaries and Employee Benefits

As expected, salaries and benefits represent approximately 50% of the total expenditures incurred during the year. Salaries have continued to increase over the prior year in response to the growth of operating beamlines during the year ended March 31, 2010. There are currently 174 employees at the CLS; with the most growth in experimental facilities personnel who are involved in the operation of experimental facilities and provide assistance to users that visit the facility. While there have been some delays in hiring personnel, the projected positions are largely filled and these expenditures are expected to track closer to budget in the future. To the extent that employees are engaged in the design and development of new beamlines, their salaries are recovered from the capital funding provided for beamline projects (in the current year $800K was recovered). Employee benefits are budgeted and represent 15% of salary expenditures.



2. Maintenance

Maintenance expenditures are required to keep the facility state of the art and largely relate to the maintenance of the the core infrastructure (power supplies, pumps, cooling systems, vacuum systems, HVAC), including the conventional building systems, core linear accelerator, booster and storage ring. Control systems (equipment monitoring, access systems, electronics) and IT infrastructure are also significant maintenance efforts. These expenditures are tracking closely to projections and will increase significantly as the facility ages.

Beamline and endstation maintenance for each experimental facility is estimated to be approximately $30K per beamline. As additional beamlines come into operation and current beamlines age, these expenditures are anticipated to increase.

3. Materials, Supplies and Services

Material, supplies and services includes the general operational expenditures required to keep the CLS in a state of readiness for researchers and to ensure the safe operation of the CLS. This includes materials for conventional and technical core gases required for cooling, machine shop consumables, office supplies, paper, library and publication

purchases, computer supplies, consulting services (technical and general), office supplies and miscellaneous requirements for operations and administration of the facility.

Many of the goals included in the strategic plan relate to the outreach activities to develop the user community and further engage industry. CLS is active in hosting various national and international conferences and lectures, including an annual user meeting. Sponsoring various science community workshops also ensures that CLS stays abreast of new directions in science in general, and how synchrotron science will be used to advance research. Annual scientific activity reports have been prepared since 2006 to highlight research being performed at the facility.

4. Equipment & Capital Enhancements

Major equipment and capital expenditures have been prioritized in the strategic plan to ensure the facility develops in accordance with the identified goals. The major projects that were in progress during the past year were:

- Industrial / Educational beamline (IDEAS) – current year expenditures were $442K of an overall budget of $1.3M. This beamline will support the CLS industrial program and the educational outreach program. The beamline's detailed designs are complete, with procurement and installation of components in progress, including a monochromator that has been provided by Bonn University. This project has a targeted completion date of December 2010.

- Electron Linac Refurbishment – current year expenditures of $1.4M of a budget of $2.9M. This project consists of replacing the three linear accelerator sections installed during the 1960's, replacing all six modulators which were modifications of the original three modulators built in-house during the 1960's, replacing or upgrading beam optics and diagnostics and replacing all of the original power supplies for the linac magnetic components. This project is scheduled for completion in 2010.

Several other capital projects have started but significant expenditures have not been incurred to date. Since most capital enhancements must be installed during planned shutdowns of the operations (twice a year) and with reference resources required for the major CFI-funded beamline projects, delays are inevitable. Projected expenditures in future years will account for these budgeted expenditures to ensure completion of these important enhancements to the CLS.