

Monitoring the Prairie Grain Handling and Transportation System

Report:

**The Development of a Sales-Based
Methodology For Tracking System
Reliability In The Grain Handling
and Transportation System**

CONFIDENTIAL

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Table of Contents

Executive Summary	3
1.0 Introduction	5
1.1 Overview of the Grain Monitoring Process	5
2.0 Objective	6
3.0 Methodology	7
4.0 Consultation Input	8
4.1 Sales Process Maps	8
4.2 Measuring System Reliability	8
5.0 Assessment of Input	11
5.1 Sales Process Maps	11
5.2 Measuring System Reliability	11
5.3 OAG’s Analysis of Grade Demotions	11
5.4 CWB and Non-CWB Sales Processes	12
6.0 Recommendations	15
7.0 Appendix	16

Executive Summary

As part of the Federal Government's Grain Monitoring initiative, the need for supplemental studies in six specific areas was determined in order to enhance and elaborate on the original design. This study covers the item calling for the **development of a sales-based methodology for tracking system reliability** of the Grain Handling and Transportation System (GHTS).

This supplementary item arose out of the original design for the grain-monitoring framework. The assumption behind the need for a sales-based methodology to monitor system reliability was that delivering the **"right product at the right time to the right customer"** is a critical success factor for the GHTS. It should be noted that the GMP has a number of measures for system reliability such as Stock to Vessel and Stock to Shipment ratios at terminal elevators. This study is intended to build on these measures through a link to the sales and back into the country network.

The objective of this supplemental item is to develop practical options for a measures methodology that tracks the reliability of the grain handling and transportation system based on the terms and conditions of sales made. The methodology developed was to focus on rate-regulated movement of both Canadian Wheat Board (CWB) and non-CWB grains in relation to sales contracts, including an assessment of grade demotion (filling a contract with higher quality grain than specified in the contract) that occurs.

Because of the challenges inherent in the creation of a Sales Based measures methodology, the consultant conducted the study through two components. First, the sales process was defined and mapped for both Board and Non-Board grains, as well as for specialty crops. The second was the discussions with stakeholders and the subsequent analysis of the potential measures and methodologies.

A thorough investigation of the feasibility of incorporating sales-based reliability measures into the ongoing grain monitoring program was conducted by the consultant. As noted above, process maps describing the sales process in the GHTS were developed and provided the basis for discussions with the stakeholders most affected, in particular the Canadian Wheat Board, grain companies, railways and certain producer groups. This report discusses in detail the outcome of these meetings and discussions.

The conclusion coming from the discussions found broad stakeholder agreement that while the concept of **"right product at the right time to the right customer"** is appropriate, it is too simplistic to approach a measures methodology from that perspective. In particular the fact that sales and logistics decisions are made without certainty and that the system is delivering multiple products, with multiple values, to multiple customers must be taken into consideration.

In addition, in order to entice a sale, sellers may make conscious decisions to incur demurrage, carry inventory, blend grain, and fill orders with higher than specified grades. To build a measure that considers all of these issues would be problematic, if not impossible to accomplish in an objective and meaningful manner.

Compounding this is the data that would be required to produce these measures. Even general sales information from a grain company or the CWB constitutes commercially sensitive data and to request it would be considered intrusive.

It was determined the proposed measures (and the sales-based methodology) would not be effective measures of system reliability. Stakeholders believe that the cost of attempting to construct these measures would significantly outweigh the benefits (if any). With respect to the issues of grade demotions and blending, the team believes that the work done by the Office of the Auditor General (as covered in section 5.3 of this report) provides a credible estimate of the extent of the practice.

The sales-based team also presented a series of proxy measures for system reliability to stakeholders. These measures were also found to be flawed and impractical by the stakeholders. The sales-based team concurs with these views.

Based on our analysis, this report finds that it is not feasible or prudent to incorporate sales-based or additional proxy measures of system reliability into the ongoing grain monitoring program. Further, it is recommended that the client not pursue a Stage 2 report to develop measures methodology.

1.0 Introduction

As part of the Federal Government's Grain Monitoring initiative, the need for supplemental studies in six specific areas was determined in order to enhance and elaborate on the original design. This study covers the item calling for the **development of a sales-based methodology for tracking system reliability** of the Grain Handling and Transportation System (GHTS) that is to be subsequently incorporated into the base Grain Monitoring Program (GMP).

Delivering the “right product at the right time to the right customer” is a critical success factor for the GHTS. Symptoms of having product out of place include the following:¹

- Higher vessel demurrage charges and multiple berthing costs
- Lost dispatch revenues
- Grade demotions (filling an order with higher quality grain) or blending down to meet order specifications
- Excess terminal storage charges and inventory carrying costs
- Congestion and inefficiencies throughout the GHTS
- International damage to Canada's customer service status

This report **outlines the methodology** utilized on this project by the Sales Based Team, **discusses the results of consultations** with stakeholders, and **provides a recommendation** regarding a sales-based methodology for tracking system reliability.

1.1 Overview of the Grain Monitoring Process

On May 10, 2000 the Federal government announced a series of reforms to policies on the handling and transportation of Western Canadian grain. As part of the reform, it was announced that an independent third party would be appointed to provide a transparent and continuous monitoring program to assess the overall efficiency of the grain handling and transportation system, including the impact of changes on farmers, the CWB, railways, grain companies, shippers and ports.

This policy states that a mechanism is to be put in place to assess:

- the benefits to farmers;
- whether the CWB marketing mandate is adversely affected;
- the effect on grain handling efficiency;
- the effect on railway efficiency;
- the effect on port efficiency for grain; and
- the overall performance of the grain handling and transportation system.

On June 19, 2001 Transport Minister David Collenette, together with Ralph Goodale, Minister of Natural Resources and Minister responsible for the Canadian Wheat Board, and Lyle Vanclief, Minister of Agriculture and Agri-Food, announced that Quorum Corporation has been hired to monitor and assess the overall efficiency of Canada's grain handling and transportation system.

Quorum Corporation will track overall changes in the structure of the grain handling and transportation industry, the effectiveness of Canadian Wheat Board tendering, commercial relations, the efficiency and reliability of the system, short-term operational performance and producer impacts. Freight and handling rates will also be monitored at selected grain delivery points.

The process Quorum will employ in the execution of its duty as the Grain monitor will include extensive and ongoing discussions with industry stakeholders – both to solicit the opinions and expertise of the industry as well as to ensure that as broad a view as possible is taken in measuring the efficiency of the GHTS.

¹ Transmode, “

2.0 Objective

The objective of this supplemental item is **to develop practical options for a measures methodology that tracks the reliability of the grain handling and transportation system based on the terms and conditions of sales made.** The methodology developed will focus on rate-regulated movement of both Canadian Wheat Board (CWB) and non-CWB grains in relation to sales contracts, including an assessment of grade demotion (filling a contract with higher quality grain than specified in the contract) that occurs.

3.0 Methodology

At the outset of this project it was recognized that the development of a sales based methodology to measure system reliability presents a number of challenges. The challenges lie in terms of developing a measures methodology as well as with the determination of the requirements and availability of data needed to “feed” the measures. It was recognized that stakeholders might find that the data requirements to construct order fulfillment rates (% of sales contracts successfully fulfilled in terms of quality, volume, and time) for Board and Non-Board grain as intrusive. The issue of grade demotions was viewed as the most difficult and controversial portion of the development of a sales based reliability tracking measurement system. Although matching grade patterns to sales requirements fits within the criteria of ensuring that “the right grain is in the right place at the right time”, merchandising decisions which are influenced by overall crop quality, producer deliveries, and the potential for spot sales, can play a significant role in determining what grains and grades get loaded to vessels.

Because of the inherent challenges, **the consultant conducted the study in two stages:**

Stage I consisted of development of a discussion document and draft process maps of the sales and logistics process for both CWB and non-CWB grains. A series of consultations provided for an exploration with stakeholders regarding the process maps and discussion of options to measure sales reliability. During this stage, stakeholders were asked to assess the benefits and costs of the performance measurement options. This report constitutes Stage One.

This phase would conclude with the submission of a report that would detail the grain supply chain process and provide a series of measures and alternatives, including the linkages between decisions on sales planning, contract fulfillment, logistics planning and operations.

The second stage would be to take the most practical option(s) drawn from the Phase 1 report as determined by the Federal Government and develop it to a full measure to be included in the base design.

In this, Stage I, the sales-based team met with the stakeholders shown in the following table. During the discussions, stakeholders were asked for comments and suggestions on the sales process maps developed by the consultation team. They also provided advice about options to measure sales reliability, including grade demotions. The team also had the opportunity to discuss the CWB sales process with the CWB personnel and a non-CWB sales process with personnel from Agricore United.

Stakeholders Consulted	
CN	CP
WGEA	CSCA
CWB	Agricore United *

** Provided input on non-CWB sales process*

4.0 Consultation Input

4.1 Sales Process Maps

Stakeholders were asked to review draft process maps for CWB and non-CWB grains. The following table shows the input received.

Input Regarding Sales Process Maps	
Issue	Comments
Blending at Port	While grain companies can blend Board grains in the country, blending at the port must be authorized by the CWB and CGC.
Time Dimension	The maps are static and do not show the timing of the processes. At the west coast very few CWB sales are spot sales (taking between 3 and 4 weeks). The vast majority of CWB sales at the west coast are planned and made within 2 months. CWB sales moving through the eastern system take longer (greater distance and more handling). There are more spot sales for CWB grain from eastern transfer facilities.
Special Crops	The non-CWB process map is an acceptable representation for feed peas. However, the process map is not accurate for other special crops. A separate map for other special crops (food peas, chick peas, lentils, etc.) that are moved in hopper cars should be developed. Special crops are co-mingled (as opposed to blended) at processing plants and at port. Cleaning is done selectively, depending on the crop. Special crops are not repositioned in country. "Product" should be substituted for grain and "delivery point" instead of elevator. Cash tickets are not always issued at the time of delivery. A promissory note may be issued instead.

4.2 Measuring System Reliability

Stakeholders were asked to review the following system reliability measures; measures currently included in the GMP, sales-based measures, and proxy measures. The base grain monitoring process provides quarterly reporting on port and country reliability measures as well as efficiency measures. As a group, the **current measures** provide an indication of the system's performance in delivering the right grain at the right time to the right customer. While the current measures provide some insights into sales reliability, they are not congruent. The proposed **sales-based measures, on the other hand, focus on explicit sales fulfillment rates and whether the system is unloading at port, moving to port, and taking delivery in the country the right products at the right time.** Sales based measures to track the extent of grade demotions were also included. The data requirements for the sales-based measures are substantial. One alternative to examining all sales would be to examine a selected number. However, surveying a smaller number of sales may not produce an accurate measure. Unless another acceptable alternative can be found, the only approach is the complete examination of sales. Stakeholders must believe that the benefits of a complete examination of sales data would outweigh its costs (time, money, confidentiality, etc) and be prepared to assist in the compilation of the data.

Proxy measures (at a high level) were also discussed. The proxy measures, which could illustrate the degree of reliability within the system, were included in the event that the sales-based measures were deemed to be unmanageable by stakeholders.

Measures for Discussion

Current Measures	Sales-Based Measures	Proxy Measures
<p>Port Reliability:</p> <ul style="list-style-type: none"> • Average weekly stock-to-vessel requirements ratios by grain at Vancouver and Thunder Bay • Average weekly stock-to-vessel requirement ratios by grain and grade at the Pacific Seaboard and Thunder Bay • Average weekly stock-to-shipment ratios for Board Grains and Non-Board Grains at Vancouver and Thunder Bay • Terminal handling revenues at Vancouver and Thunder Bay • CWB carrying costs at Thunder Bay and the Pacific Seaboard • Annual stored tonne-days for Board and non-Board grains by port <p>Country Reliability:</p> <ul style="list-style-type: none"> • Annual stored tonne-days for Board and Non-Board grains by province <p>Supplemental Efficiency Measures:</p> <ul style="list-style-type: none"> • Average weekly stock-to-shipment ratios by grain and grade at port positions • Distribution of vessel time spent waiting and loading grain at ports • Distribution of vessels loading at multiple berths • Annual demurrage costs and dispatch earnings for CWB and non-CWB grains • Average days in store in both country and terminal elevator systems 	<p>Contract Fulfillment Rate:</p> <ul style="list-style-type: none"> • Percent of Board and Non-Board sales contracts successfully fulfilled (product quality, volume, delivery period and any other specific requirements). <p>Terminals:</p> <ul style="list-style-type: none"> • Percent of weekly (monthly or quarterly, if necessary) car unloads matched by sales contracts, and percentage of weekly product in-store not matched by sales contracts. <p>Rail Movements:</p> <ul style="list-style-type: none"> • Percent of weekly (monthly or quarterly, if necessary) car movements matched by sales contracts, including the percentage of weekly cars with terminal authorization. <p>Elevators and Producers:</p> <ul style="list-style-type: none"> • Percent of quarterly producer deliveries matched by sales contracts, percent of quarterly carloads matched by sales contracts, and percentage of quarterly product in-store not matched by sales contracts. <p>Contract Calls and Elevator Shipments:</p> <ul style="list-style-type: none"> • Track relative ratios over time. <p>Contract Calls and Tender Calls:</p> <ul style="list-style-type: none"> • Track ratios monthly (quarterly, if necessary). <p>Vessel Arrival Windows:</p> <ul style="list-style-type: none"> • Track accuracy of the notice of contract period, call period and ETA. <p>Resource Planning Time:</p> <ul style="list-style-type: none"> • A measurement of the notice or lead time that is provided to carriers and terminal operators of sales programs. <p>Grade Demotions:</p> <ul style="list-style-type: none"> • Grade Demotion Rate – Percent of contracts fulfilled with higher quality product (number and volume of demotions by grade). • Blending Rate – Percent of contracts involving higher quality grains (by volume) used in blending to fulfill advance sales, when product was available elsewhere in the GHTS (including measures for fulfilling spot sales). 	<p>Logistics Chain:</p> <ul style="list-style-type: none"> • Producer deliveries relative to contract calls (CWB grains) • Contract calls relative to projected/actual sales programs (CWB grains) • Producer deliveries relative to projected/actual sales programs (non-CWB grains) • Car orders relative to vessel requirements (CWB and non-CWB grains) • Car unloads relative to car orders (CWB and non-CWB grains) <p>Forecast Accuracy:</p> <ul style="list-style-type: none"> • Accuracy of quarterly forecasts for Board and Non-Board grain sales (ratio of actual to forecast)

The discussions with the stakeholders regarding the **sales-based measures** solicited input in the following areas:

- Do the indicators measure sales reliability?
- Is the data available to feed the measures?
- Are there any confidentiality issues regarding the data?
- What is the estimated cost of pulling the data together?

- Does the expected benefit of the measures and the information they would provide outweigh the expected cost of formulating the measures?

Input was also solicited on the following:

- Do the current system reliability indicators supplemented with selected efficiency indicators provide an indication of system reliability?
- In the event that the sales-based measures are unacceptable or infeasible, would the proxy measures be acceptable?

The input received from stakeholders is summarized in the following table.

Stakeholder Input on Reliability Measures	
General	<p>This undertaking could easily become a finger pointing exercise. The approach does not recognize the risk of a sales strategy. System reliability reflects the sales strategies of the participants. Marketing and logistical decisions are made consciously. Consequently, indicators like demurrage may not signal a breakdown in system reliability. The probability of making a sale needs to be incorporated.</p> <p>Grain merchandizing is complex – decisions are made carefully and include an assessment of the risk involved. This initiative fails to incorporate this complexity. Measuring items such as demurrage and dispatch in order to track system reliability, is incomplete, in that it does not reflect the trade-offs made at other points in the sales chain. Therefore using these measures may provide incorrect and misleading information and could result in behavioural changes, which would not enhance system reliability.</p>
Current Measures	<p>Current system measures are acceptable, although they may not be accurately measuring reliability.</p>
Sales-Based Measures	<p>Stakeholders questioned the feasibility of success in establishing measures for both system reliability and grade demotions.</p> <p>Stakeholders believe that the cost would be significantly greater than any potential benefit. One company estimated that its cost alone would be about \$100,000 to provide the data necessary to calculate the measures. The non-board measures will be meaningless because of the “fuzzy” boundary between logistics and marketing.</p> <p>All contracts are either completed or cancelled. There may be significant amendments or changes made. Contracts have sufficient premium/discounts incorporated into them to cover various situations.</p> <p>Costs would outweigh the benefits. Contracts are confidential and contain commercially sensitive information.</p> <p>Grade demotions by the CWB are described as “application” decisions. The Auditor General provides information on applications in the Special Audit Report dated February 27, 2002.</p> <p>For special crop shippers, system reliability means getting the cars requested. They want to know the extent of rationing of cars for special crops relative to other commodities. Obtaining this information has proven difficult.</p>
Proxy Measures	<p>One railway expressed sensitivity regarding the car order indicator and feels uncomfortable with tracking it because of potential liability issues. Vessel bunching may be a good indicator. The accuracy of demand forecasts was questioned.</p> <p>Measuring forecast accuracy is impossible and of little value therefore it is not possible to calculate producer deliveries relative to projected/actual sales program for non-Board grains.</p> <p>Producer deliveries relative to contract calls won't provide much information. The best measure is the car orders relative to vessel requirements.</p> <p>The CWB provides an indication of the sales program by month for terminal operators in November. This information might be available.</p> <p>The coordination of unloads with vessel arrivals is a critical success factor.</p>

5.0 Assessment of Input

5.1 Sales Process Maps

Based on the input received from stakeholders the CWB grain map was revised to indicate that blending at the port only occurs with authorization from the CWB and the CGC. An additional map was developed to represent the sales process for special crops.

The finalized maps for CWB grain, non-CWB grain, and special crops (other than feed peas) are contained in the appendix. The maps are still static in nature. The consultation team determined that it was not practical to add a time dimension.

5.2 Measuring System Reliability

Based on the input received during the consultations, the sales-based team constructed the following scorecard to determine the feasibility of implementing sales-based reliability measures. **As the scorecard clearly indicates, incorporating sales-based measures of system reliability into the ongoing grain monitoring program would not be successful.** The proposed measures (and the sales-based methodology) would not be effective measures of system reliability. Stakeholders believe that the cost of attempting to construct these measures would significantly outweigh the benefits (if any).

Scorecard for Sales-Based Measures			
Element	Yes	No	Comments
Do the indicators measure system reliability?		X	The measures would provide an inaccurate picture of system reliability. In a commercial grain merchandizing system it is not possible to utilize sales based measure to indicate system reliability.
Is the data available?		X	The data is not readily available.
Are there confidentiality issues?	X		Sales contracts are confidential. Some railway information is also confidential.
Estimated cost of obtaining data?			Approximately \$1 M. This is based on a \$100,000 estimate for a large grain company to pull together the required data. Given the number of grain companies and the number of transactions handled by the CWB (5,000 in 1999-2000), the costs of the exercise could easily reach \$1 M.
Benefit > Cost?		X	Stakeholders in agreement that the expected benefits of this exercise would not outweigh the costs.
Any redundancy?	X		OAG recently reviewed CWB application decisions.

Stakeholders also viewed the proxy measures as less than useful because of confidentiality issues and design problems. The general response was that they would also require significant effort and resources and would provide minimal reliable output. The sales-based team concurs with their assessment.

5.3 OAG's Analysis of Grade Demotions

The Office of the Auditor General (OAG) undertook a special audit of the CWB's financial accounting and reporting systems and management practices. The independent audit utilized approximately 11,000 hours of audit staff time. One of the areas examined was blending and application decisions at the port terminals. **The OAG found the following:**

"In co-operation with the Canadian Grain Commission, the CWB makes blending decisions to load the customers' vessels. The purpose of blending is to expedite the loading of

customers' vessels and make the most efficient use of the CWB's grain inventories to meet or exceed the minimum grade and protein levels required in the sales contracts. Blending results in a net cost to the CWB when the blended grades and protein levels applied exceed the minimum grade and protein levels required under the sales contract. We reviewed the application decisions made by the CWB and found that the CWB closely monitors and attempts to minimize any over-application of grades and protein levels in meeting its sales commitments. The total estimated costs resulting from the over-application of grades and protein levels was less than 2 percent of total export sales for the 1999-2000 crop year.”²

The sales-based team believes that it is well beyond the scope of the grain monitoring program to replicate the well respected work of the Auditor General on grade and protein demotions (applications).

5.4 CWB and Non-CWB Sales Processes

The sales-based team had the opportunity to discuss the sales processes employed by the CWB for CWB grains and Agricore United for non-CWB grains.

CWB Sales Planning and Execution Process

Early in each crop year, the CWB sales department produces an annual plan. Projections by month are included. The annual plan incorporates items such as available capacity by corridor, availability of product, location of product, logistics costs, preferable port destination, etc. This information will be matched to the customer base to provide a projection of movement throughout the crop year. The sales department produces a formal plan, which is provided to senior management on a monthly basis. The plan is dynamic and includes an update of activity from the previous month's plan (i.e. customer needs, availability and location of product, capacity by corridor, etc.).

Sales are made within the scope of the plan. Unanticipated, or spot-sales, may be added from time to time. Amendments to firm sales are not uncommon. Either the buyer or the seller may request an amendment to any aspect of the sale (i.e. class of wheat, grade, time-frame, etc.). The CWB Planning and Coordination section keeps track of every sale and amendment. On a daily basis, Planning and Coordination produces a "Firm and Reserved List" including all firm sales and those with a 70% or greater chance of fulfillment.

At the same time, a detailed position statement (grain, grade, sales contract) for each corridor is produced. The position statements detail where the supply is, in relation to each vessel. West Coast contracts include a Vancouver or Prince Rupert option.

An estimate of demand is provided to the railways on a monthly basis. When car availability is not sufficient to meet the CWB and non-CWB demand, rationing is required. The railways have chosen to make allocation decisions in differing ways. CP will cut back orders equally across all requests. CN, on the other hand, relies on a historical pattern to make the split of the car supply.

Car orders for CWB grains are placed either through the tendering process or the car awards program (CAP). The weekly car supply is projected to meet demands three weeks hence. These orders become the confirmed loading program, or open orders. Cars ordered via the tendering program are all destined to meet confirmed sales, as there is a "lift" requirement included in the tender contract.

Current practice for vessel nomination and arrival starts with a 30-day contract period. On the first day of the contract period, it is necessary to narrow to a 20-day call period.³ With 12 days notice, the vessel ETA is provided. The ETA should fall within the call period. In any given week, one half of the car orders will be to nominated vessels (to the 20-day call period). Upon arrival, the vessel must pass inspection by both the Port Warden and the Canadian Food Inspection Agency.

² Office of the Auditor General, "Canadian Wheat Board Special Audit Report", February 27, 2002.

³ The CWB has reached agreement with industry to narrow the call period to 15 days.

When cars unload at terminal position, a terminal receipt (out turn) is issued by the CGC. The CWB compensates the shipping grain company with the equivalent of the initial payment. The CWB takes possession of the grain at this point and the terminal has liability for the grain. When the vessel is on berth, the CWB calls the paper and the grain company/terminal is obligated to deliver the grain to the vessel.

The CWB currently makes about 90% of export sales on an in-store or a free on board (FOB) basis.⁴ The remaining 10% are made on a cost, insurance and freight (CIF) basis.⁵ It is the customer's preference as to which method is used. Some purchasers own vessels, and therefore prefer to nominate their own vessels (FOB sales). Nonetheless, the proportion of CIF sales is growing. Booking vessels for CIF sales provides the CWB with greater control of the grain movement. The CWB does have the ability to apply punitive carrying charges on FOB sales.

The grain is "called forward" for loading to vessel. While vessels are being loaded, both the CWB and the vessel manager maintain independent "statements of facts", including details of activities such as when loading starts and stops, when they switch holds, rain delays, gross tonnage by grade, etc. These statements will be the basis of any dispatch payments or demurrage charges. The "terminal invoice" is released when vessel loading is complete.

The various steps in the CWB process are as follows: sales plan, sales program including amendments, position statements, contract narrowing, vessel nomination, vessel manifest, vessel on berth, grain called forward, statement of facts, and terminal invoice.

Non-Board Planning and Execution Process

Profitability is the key measure of success for the non-Board shippers. It is driven and measured by volume and revenue per tonne. Throughput is key to grain companies. The goal is to maximize capacity utilization. Minimizing costs and maximizing revenue is imperative with all throughput.

Non-Board export shippers use a "pull" system to maximize capacity utilization. Capacity of facilities, both country and terminal, is essential in sales planning. Port fobbing capacity will dictate the level of sales activity. West Coast capacity may constrain sales activities. Meeting customer's needs is also a high priority.

Shipments from country positions are directed toward vessels. The vessel ETA is the key in programming. There may be a number of sales all destined to be loaded to the same vessel. The aim is to ensure that stocks are queued in a similar fashion to the vessel line-up.

Vessel slippage does happen. Risks decline as the date of vessel arrival narrows, due to better information on the ETA. Shippers and exporters track vessels closely to allow any adjustments to be as responsive as possible. Vessels must pass inspection by the Port Warden and the Canadian Food Inspection Agency. It is important that exporters do due diligence on the vessels, to ensure the minimum of disruption due to vessels failing inspection.

Fluid communication between terminal, transportation department and country operations is key to efficient execution of the sales/logistics chain process. Numerous considerations face shippers: what product; will cleaning be required; from what stations or area will the grain be drawn; from how many stations will it be drawn; what will be the transit times; are there any railway capacity constraints? It may require anywhere from one to three weeks to move product forward, depending on these factors. Ongoing communication with the railways is necessary to ensuring the best utilization of resources. The transit time from some high throughput facilities is only three or four days. Programming shipments for either the beginning or the end of the week may be important, to ensure optimal arrival at terminal position.

⁴ FOB sales result in the buyer taking possession of the grain as it leaves the spout and is loaded to the vessel.

⁵ CIF sales require the seller to book the vessel and be responsible for the grain until it unloads at the buyer's port.

Multiple car shipments of 50 cars usually consist of solid trains (same commodity and grade). The 100 car shipments more often will consist of a mixture (tendered, non-tendered, CWB, non-CWB). They still have to unload at a single terminal. Railways offer a split tracks option, whereby for a premium, they will spot the cars at more than one terminal. Providing the railways with regular updates and projections by terminal assists in ensuring precision with shipments.

Management of terminal inventory includes decisions regarding cleaning and blending. Blending potential and/or requirements are analyzed for each shipment. Decisions must be made regarding cleaning in the country or at terminal position. Some companies prefer to clean grain at terminal position with larger, more efficient equipment. Others may prefer to clean in the country as opposed to ship to a terminal where they would not share in the revenue generated from by-products.

Terminal authorization will be provided to third-party shippers on a case-by-case basis. The terminal management requires information on the vessel ETA before providing the authorization. Considerations include cleaning requirements, rail transit times and the impact on CWB programs.

The conditions set out in the sales contract drive the performance in the system. Non-Board shippers prefer to sell CIF or FOB. Greater control is achieved through these types of sales. When selling FOB, punitive carrying charges will be in place to deter vessel slippage. If there are no penalties in the contracts there is a wide window within which to perform, leading to inefficient use of resources. Selling CIF provides the greatest level of control over product moving through terminal facilities. The relationship with customers is also very important and concessions may be necessary to maintain valued customer loyalty.

An increase in identity preserved shipments requires more coordination at the elevator level. The number of grades for non-Boards is not great. The vast majority of commercial canola is shipped as No. 1 Canada Canola. As the number of grades increases, efficiency may be lost. There is a trade off, between the higher value achieved by segregating product and the cost incurred to provide the service. The value of a spot sale must also include the trade off of the cost of holding inventory in position, compared to the premium received from the sale. Throughput is far more important than storage revenue.

Grain companies prefer to utilize a supply chain process, where movement is treated as a pipeline. Individual components are not as important as the goal of total system optimization. Introduction of third parties into the pipeline can also introduce inefficiencies, which translate into extra costs.

The following table summarizes the critical information about the two sales processes. It is readily apparent that major differences between the processes include their objectives and constraints, asset ownership, and the use of CIF versus FOB sales. **The Canadian GHTS is a mixed system.**

6.0 Recommendations

This project arose out of the original design for the grain-monitoring framework. The assumption behind the need for a sales-based methodology to monitor system reliability was that delivering the “right product at the right time to the right customer” is a critical success factor for the GHTS. The original design report noted the following symptoms of having product out of place:

- Higher vessel demurrage charges and multiple berthing costs
- Lost dispatch revenues
- Grade demotions (filling an order with higher quality grain) or blending down to meet order specifications
- Excess terminal storage charges and inventory carrying costs
- Congestion and inefficiencies throughout the GHTS
- International damage to Canada’s customer service status

It is our opinion that the approach specified in the **original design is problematic** for the following reasons:

- It ignores the fact that decisions are made under uncertainty and that the system is delivering multiple products, with multiple values, to multiple customers.
- It does not acknowledge that sellers may make conscious decisions to incur demurrage, carry inventory, blend grain, and fill orders with higher than specified grades.
- It does not take into account the fact that the GHTS is a mixed system with participants employing different sales processes.
- It does not specify what “higher” or “excessive” means in terms of cost.

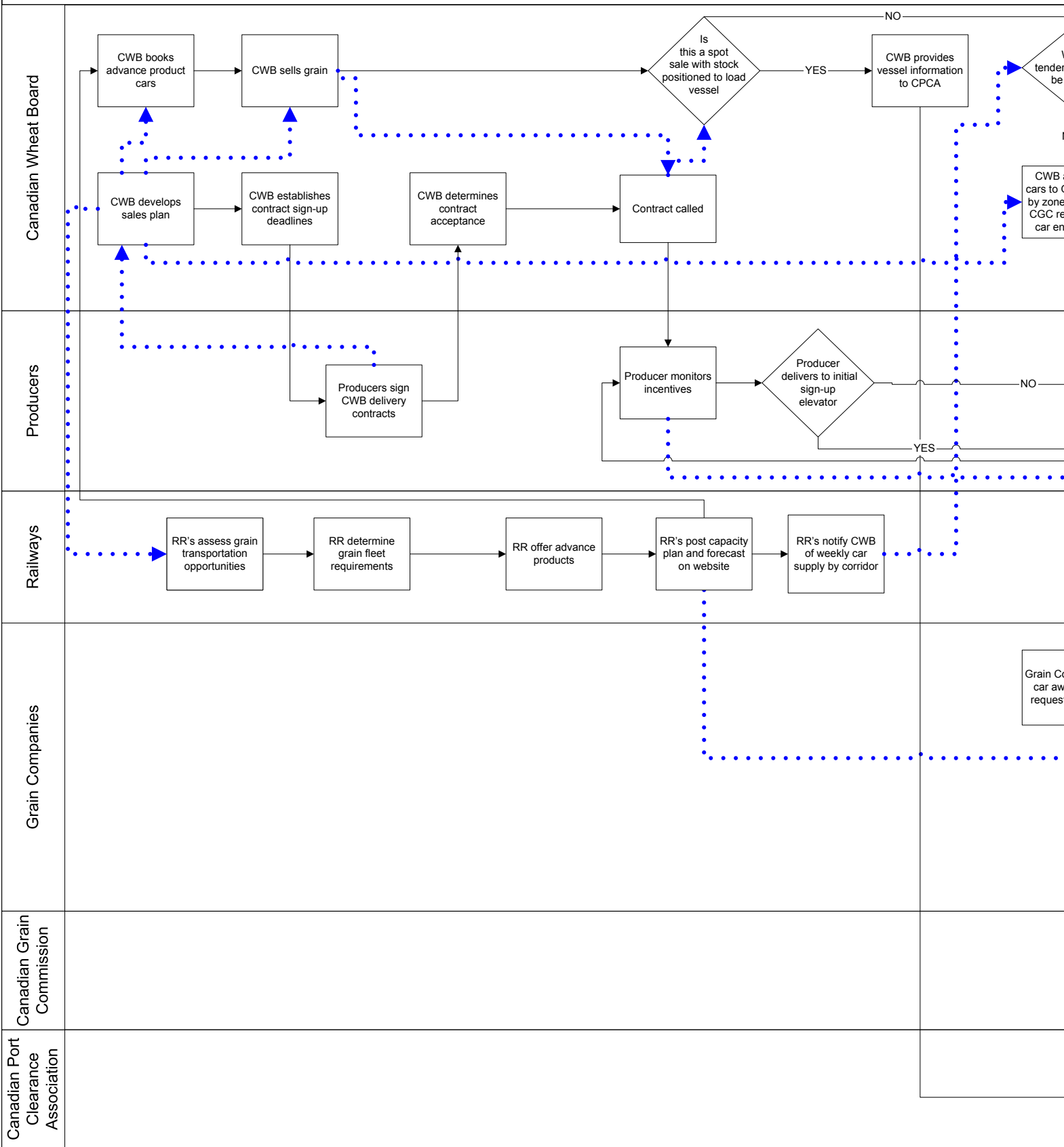
The sales-based team conducted a thorough investigation of the feasibility of incorporating sales-based reliability measures into the ongoing grain monitoring program. **The proposed measures (and the sales-based methodology) would not be effective measures of system reliability.** Stakeholders believe that the cost of attempting to construct these measures would significantly outweigh the benefits (if any). With respect to the issues of **grade demotions and blending**, the team believes that the work done by the Office of the Auditor General provides a credible estimate of the extent of the practice.

The sales-based team also presented a series of **proxy measures** for system reliability to stakeholders. These measures were also found to be flawed and impractical by the stakeholders. The sales-based team concurs with these views.

Based on our analysis, it is not feasible or prudent to incorporate sales-based or additional proxy measures of system reliability into the ongoing grain monitoring program. Further, it is recommended that the client not pursue a Stage 2 report to develop measures methodology.

7.0 Appendix

Board Grains Sales/logistics process



Non-Board Grains

