— WRITING SAMPLE —
(training video)
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VIDEO SCRIPT (15 minutes)

The Fisheries Council of British Columbia
presents

"Final Check -- The Screening Line"

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FADE IN:

TITLE SEQUENCE - A MONTAGE OF SALMON-CAN LABELS

The vendors are from many countries all over the world. When the titles end --

HOST (VOICE OVER)
All Canadian salmon. All canned and labeled in Canada.

CANADIAN FREIGHTER

HOST (VOICE OVER)
Millions of cases are shipped overseas every year. Our exceptionally rigorous standards make Canada the world leader in canned-salmon quality control.

SCOPEMAN IMAGE OF CAN DEFECT

HOST (VOICE OVER)
This is largely due to advances in can integrity screening.

PULL BACK from the scopeman to REVEAL the Host looking up from the scopeman in the DFO lab. He's an industry person rather than an inspector.

HOST
Hi. I'm visiting the Canned Fish Lab of the Department of Fisheries and Oceans. Things weren't always like this --

INSERT - HEADLINE OF BOTULISM IN EUROPE IN 1982

HOST (VOICE OVER)
In 1982, canned salmon from Alaska caused poisoning.

BACK TO LAB

HOST
Since then, nothing like that has ever happened with any Pacific canned salmon. Our inspection and screening program, developed jointly by the Canadian Fisheries Department and the members of the canned salmon

industry of B.C., ensures that it
doesn't.

Host walks over to lab worker doing organoleptic inspection.

HOST

The first stage is to inspect sample cans -- done right here by the federal government. The second, final stage is to check the integrity of all the cans going out -- and that's done by us, the salmon canning industry, at the screening line...

INT. WAREHOUSE SCREENING/LABELLING AREA - WIDE SHOT

The depalletizer looms in the foreground at one side. The Host ENTERS to stand in the center foreground with the whole line spreading out behind him

HOST

(with sweeping gesture)

This is the screening and labeling line. First I'm going to take you on a tour of the whole line and show you what screening is. Then back to the screening machines --

(points them out)

-- those two over there -- for details of how they work and how you operate them.

(reveals a sheaf of papers)

And finally I'll show you how the screening information has dramatically lowered the rate of defects throughout the industry.

(starts walking)

So here we go... the line starts here.

A SEQUENCE MOVING ALONG THE LINE

Pausing at various stations as indicated by the narration--

HOST

These bright-stacked pallets of cans came from the warehouse to fill an order... The depalletizer funnels cans into this screw feed, which spaces them out for the two screening machines... First is the check weigher. Suspect cans get ejected. The operator checks the double seam, body, and side seam for abrasions and pinholes. The ones that pass inspection are returned to the chute... Next, the double dud detector. These ejected cans come from a special small portion of all the cans in the batch as a meaningful sample. This is the real heart of the screening system -- the number of defects found in this sample is used to judge the number of defects in the whole batch. That may have a major consequence down the line, as we'll see. Most in the sample are good, and go back in the chute... Here the cans have their labels put on... Here cans are inspected for can-manufacturing defects not picked up by the two screening machines, and possibly even defects produced during labeling... Now the case packer. The carton triggers a plunger to push in the cans... Here the sealer glues the flaps down... The printer prints the carton with tracking information, including a quality assurance number. All that information is entered here on this terminal... Finally the cartons are stacked on a pallet for shipping inside large containers... But this may not be the end of the line --

GRAPHIC - A SIMPLE SCHEMATIC OF THE WHOLE LINE

HOST (VOICE OVER)

Remember the sample from the double dud detector?

A large arrow EMERGES from the screening-machine portion in the middle of the schematic and zeros in on the very end of the line.

HOST (VOICE OVER)

If that sample shows that there's probably more than forty defective cans out of one hundred thousand,

the whole batch must be inspected by
hand --

TABLE AT END OF THE LINE - CARTON AND LABEL STRIPPING

Operators are stripping boxes and labels. Then --

PERFORMING A HAND CULL

HOST (VOICE OVER)
Removing defective cans by human inspection is called culling. This entire batch must be hand culled, one can at a time. Every good and bad can is counted.

Host ENTERS. He carries three cans, which he sets down.

HOST
These cans have leaks. Each one is different. Let's see what happens when we run them through those two screening machines.

AT THE CHECK WEIGHER - HOST

He runs one of the cans through -- it's ejected.

HOST
This is the check weigher. It weighs every passing can. It ejected this can because it's underweight. This is done because a leak may cause a loss of material. The can's weight will be less than the strict weight standard maintained for all cans.

CHECK WEIGHER - RUNNING LINE - OPERATOR CULLING

HOST (VOICE OVER)
Gross underweight cans may indicate leaks. Slight underweights go into a separate lot, to be labelled differently. As you can see, most ejected cans don't have defects.

INSERT - SIMPLE GRAPHIC - PERCENT DEFECTIVE CANS CONTAMINATED

HOST (continuing)
And, as you can see here, even among all cans with defects, the actual number with contamination is very,

very small in the Canadian salmon
canning industry.

BACK TO HOST AT CHECK WEIGHER

He tries his second can --

HOST

This one isn't underweight. It was just ejected because it's overweight. A leak could also cause a can to take up water during retorting, so it would be heavier. The excess weight could also be a filling line mistake. And now for my last defective test can --

It's not ejected.

HOST

Hmm... let's see what the double dud detector does with these cans.

AT THE DDD - HOST WITH TEST CANS

HOST

This can was ejected by the check weigher... The double dud detector doesn't catch it. This is the mystery can that was passed by the check weigher... it's ejected. The reason is that the double dud detector is looking for another very important contamination indicator -- loss of vacuum.

GRAPHICS - TO ILLUSTRATE

Showing vacuum in a can, then a defect letting some air in, followed by an eerie green glow indicating germs.

HOST (VOICE OVER)

Leaks may let in some air and reseal, without loss of weight. These partial-vacuum cans are the very worst for low acid product like salmon -- that's when the deadly botulism germs grow.

Illustrate lid deflection caused by vacuum. Then show reduction of deflection by air leaking in -- a partial vacuum.

HOST (VOICE OVER)
Notice that the ends of the can deflect inwards because of the low pressure inside. A partial vacuum causes reduction of this deflection. So reduced end deflection is a good indicator of loss of vacuum -- and that's exactly what the double dud detector measures.

NEW GRAPHIC - AN ILLUSTRATIVE HISTOGRAM (COMBINED TOP AND BOTTOM DEFLECTIONS)

HOST (VOICE OVER)
This is a profile of a batch of cans. It shows how many cans there are with different amounts of end deflection, along this scale of deflection. Here in the middle, at normal deflection, there's a lot, and over here, at lesser deflection, there's few. This is a normal profile of variation, with most cans around average.

Highlight the low 3 percent.

HOST (VOICE OVER)
These lowest ones are most suspicious.

To illustrate this, show inside the area of the histogram a few glowing SPOTS that indicate defects. There are ten in the small, highlighted part, and only two in the much larger remainder.

HOST (VOICE OVER)
The spots indicate defects lurking in this batch. Most are likely to be here in this low portion. So we select this group to look at for defects.

INSERT - OPERATOR INSPECTING EJECTED CANS FOR DEFECTS.

BACK TO THE GRAPHICS - NOW A HISTOGRAM OF ANOTHER BATCH

This time showing only two spots (defects) in the sample portion, and none at all in the rest.

HOST (VOICE OVER)
If we found only a couple in the sample, then the rest likely has none at all... And, as we saw

before, because of the negligible contamination rate among defects, the safety of the rare defective can left in the bulk of the cans is virtually guaranteed.

GRAPHIC - REAL HISTOGRAM (TOP ONLY): ARROW SHOWS SET POINT.

HOST (VOICE OVER)
So the double dud detector measures can end deflections and ejects all cans with deflections below this point, called the setpoint. It ejects all of the bottom three percent. Here we're looking at the profile and setpoint for just one can end, the top. The same is done for the bottoms of the cans. Each is set to about one and a half percent.

DDD MACHINE SHOWING TOP AND BOTTOM EJECTIONS RACKING UP

Again we see the good cans returned to the chute.

The culled defective cans are starting to pile up.

HOST (VOICE OVER)
If the number of defective cans in this three percent sample indicates that there's more than 25 defects out of a hundred thousand cans...

CUTAWAY - MONTAGE OF LINE BEING STOPPED, BOXED AND LABELED CANS STRIPPED, THE WHOLE BATCH BEING HAND CULLED.

BACK TO HOST

HOST
But there's a problem. Many factors affect the amount of end deflection throughout a run of cans, no matter how good they are.

GRAPHIC - A SIMPLIFIED HISTOGRAM TO ILLUSTRATE, HIGHLIGHTING THE SETPOINT ARROW AND AREA TO THE LEFT.

HOST (VOICE OVER)
This setpoint is right for this can code.

This initial histogram is now REPLACED by another one shifted way over to the left. But the setpoint arrow remains in the same place along the scale.

HOST (VOICE OVER)
But what about this one...?

Now the area to the left of the setpoint is highlighted again -- it covers half of this histogram.

HOST (VOICE OVER)
If this was a new code coming onto the line...

CLOSEUP OF CANS ON THE LINE

Show cans with one code replaced by cans with a new code.

Immediately there's a steady stream of ejections.

HOST (VOICE OVER)
Well-- luckily this auto-controlled double dud detector corrects for this sort of thing, all by itself. Let's see how.

SCENE OF OPERATOR SETTING UP DDD

HOST (VOICE OVER)
It starts when the operator first sets up the double dud detector to run a new batch. The first one hundred cans are selected from throughout the bright-stack pallet. These are run and the machine ejects them all, building up an initial profile, and then it stops... The operator can see the profile here in the printout.

PRINTOUT WITH NORMALLY DISTRIBUTED PROFILE

HOST (VOICE OVER)
Here it also shows the initial setpoint calculated automatically by the double dud detector for those first hundred cans.

PRINTOUT WITH BIPHASIC PROFILE

HOST (VOICE OVER)
You might get a profile like this. It looks like a combination of two different profiles from different

codes. In a case like this, take a new sample. Then start the batch running again.

GRAPHIC - THE CAN "WINDOW" CONCEPT

As small set of cans enters the 100-can window and another set drops out the other end.

HOST (VOICE OVER)

The detector has this one-hundred can window to look at. It calculates an average from what's in here. As every five or ten cans is added to the head of the window, the tail cans drop out. And so the profile can gradually change to reflect the variations between can codes.

GRAPHIC - NEPTUNE'S ANIMATED HISTOGRAM, MOVING AROUND ERRATICALLY, BUT THE SETPOINT FOLLOWS IT.

HOST (VOICE OVER)

This is the result -- speeded up. See how the setpoint follows the changing profile.

A NORMAL OPERATING SITUATION

HOST (VOICE OVER)

Operators are free to deal with ejected cans and paperwork at a comfortable rate.

BACK TO THE ANIMATED HISTOGRAM - MARK THE NO-VACUUM OUTLIERS

HOST (VOICE OVER)

Finally, a few cans may have a complete loss of vacuum. In these, many different germs can grow, even bulging the can and making an odor. You can see them here as outliers - so of course, they always get ejected.

BACK TO HOST (NEAR CHECK WEIGHER)

HOST

Now let's take a brief look at the procedures operators must follow to keep the screening machines in

proper working order... We're back
at the check weigher again.

An operator now performs the tasks along with the narration.

HOST (VOICE OVER)
Setting the check weigher setpoints is easy if you've got data from an automatic filler. Just use the batch weight average... then subtract the predetermined leakage tolerance... or, instead, set the machine to eject at least a quarter of a percent. If you don't have data from the cannery, weigh at least fifty cans to get an average... Your check weigher machine may calculate a running average, shown here. The canning company can use this to compare to weight regulations, and it can be used to manually adjust the setpoints... The check weigher must be audited at least every hour, and every time there's a major change of line speed -- by testing at least one can of known weight below and above the two set points. And at least every forty hours and every change of can size, you must test a range of measured cans around the two set points.

INSERT - ANOTHER MODEL OF CHECK WEIGHER (RUNNING IN ANOTHER WAREHOUSE)

HOST (VOICE OVER)
Your screening line might have a different make of check weigher, like this one.

THE DDD WITH OPERATOR - TO ILLUSTRATE

HOST (VOICE OVER)
The double dud detector is calibrated every day or so. Take a measured can, with a known deflection, and run it through. Adjust the deflection readout if it doesn't match... Every forty hours at least, the double dud detector

gets audited. To do an audit, run through twenty five ejected cans... and twenty five cans that were passed. A graph of the end readings is made...

At this point the operator looks over the graph with the Supervisor.

HOST (VOICE OVER)
... and if it's out, the supervisor will re-adjust it.

Suddenly we show either the whole line shut down, or the double dud detector starting continuous kickout --

HOST (VOICE OVER)
If this happens, it's likely a warning from the double dud detector, telling you that the operating setpoint has gone too low.

INSERT - GRAPHIC - HISTOGRAM TO ILLUSTRATE

HOST (VOICE OVER)
If the batch profile shifts down too low, the operating setpoint will go below the established minimum setpoint, as shown here. That means the profile is changing too fast for the machine to handle.

BACK TO OPERATOR AT DDD.

HOST (VOICE OVER)
Terminate the run and re-start as a new batch...

THE OTHER MAKE OF DDD

HOST (VOICE OVER)
Your auto-controlled double dud detector may be a different make, like this one, but the principles are the same.

A MANUAL DDD MACHINE - OPERATOR ILLUSTRATES

HOST (VOICE OVER)
You may even operate one of the older manual types, like this one... To set up for a run, a counter-sink gauge is used to measure the

deflection on about fifty cans, top and bottom, entered onto this profile form... Choose the second lowest one from each as the three-percent setpoint to enter... Every half hour or less, record the number of cans run and ejected. Calculate the current percentage ejected. Re-adjust the machine manually, if necessary, to maintain an ongoing three percent ejection rate... As you might guess, these manual machines aren't as dependable, and they're being phased out.

BACK TO THE HOST (WITH CLOSEUPS OF REPORTS TO MATCH NARRATION)

HOST

Many records are generated from the running of a batch. They're kept for a least a year. A performance record, such as this one --

(shows Neptune printout)

-- is printed out automatically by the double dud detector, and kept as a permanent record. Here every thousand cans automatically causes a line to print, showing the number of cans run, the operating set points, and the percent ejected...

(shows cull report)

Most important is this form -- the cull report. It shows the total number of cans ejected for the lot. Here it lists all the cans with major defects found in the sample, and here all minor ones.

SHOTS OF DEFECTIVE CANS MARKED WITH FELT PEN (OPTIONAL)

HOST (VOICE OVER)

The defects are classified into various types. This is very useful information, as we'll soon see. The cull report is sent to Fisheries and Oceans. They stamp and return it to verify that standards have been met.

BACK TO THE HOST

Now perhaps we follow the Host as he walks toward the end of the line, continuing to speak --

HOST

The screening and labeling line is the last chance to catch that rare dangerous can. But not only that --

(he holds up the cull report)

-- this information is the reason for why the rate of defects in our salmon canning industry is kept so low in the first place. Let me show you how... (he walks off)

INT. CANNED FISH LAB - HOST

Show the board hung with samples of can defects.

HOST

The type of defect tells us the source of the defect. They can be due to workmanship...

SUPERIMPOSE HEADINGS to match --

HOST

...machine adjustment problems... the handling system... or the manufacturing of the cans.

He shows a can with a cut seam --

HOST

For example, this can has a cut seam. This defect can be caused by the can handling system used during canning. This sort of information, gathered from all the warehouses, is summarized by Fisheries and Oceans in monthly reports sent back to the processors. It points out where improvements could be made. The result --

GRAPHIC - BAR CHART - THE DECLINE IN DEFECT RATE SINCE 1981 (GRAPH 1, DEVLIN)

HOST (VOICE OVER)

-- is this. The rate of defects found throughout the Canadian salmon canning industry has dramatically dropped since 1981. This is because the most important sources of defects were identified and upgraded.

GRAPHIC - PIE CHART - PROPORTION OF DEFECTS FROM DIFFERENT SOURCES (GRAPH 3, DEVLIN) - HIGHLIGHT WORKMANSHIP

HOST (VOICE OVER)
For example, workmanship was the biggest piece of the defect-source pie.

INT. CANNERY PATCHING LINE - THE "SPOTTER"

HOST (VOICE OVER)
A major improvement was to add this new job position, the "spotter", at the end of the patching line, to remove cans with flange interference problems before they go into the clincher and closing machine.

BACK TO HOST

HOST
This program of screening and giving feedback to the processors is unique to the Canadian canning industry, and sets a high standard for other countries. Much of this achievement is due to the technological advances we've just seen on the screening line --

A SERIES OF SHORT SHOTS TO RECAP

HOST (VOICE OVER)
The weight checker catches leakers that have lost weight. The double dud detector catches leakers that have lost vacuum, and, most importantly, monitors the whole batch for safety and the possible need for hand culling. The floating set point provides accuracy and eases the load for the operator. The screening machines are regularly

calibrated and audited. Records are essential for tracking lots and for providing ongoing improvements throughout the industry.

HOST WITH OPERATORS

HOST

Our achievement is also the result of the diligence and care of our operators --

OPERATORS AT WORK

Feeling cans for defects. Monitoring the accumulation table.

HOST (VOICE OVER)

All operators are quality assurance personnel, at all points on the line. In fact, the rate of defects is so low that the canning industry is now self-monitoring, with support and guidance from the Department of Fisheries and Oceans.

INT. GROCERY STORE WITH HOST

As a customer selects a generic salmon can.

HOST

The success of our screening program produces an excellent reputation for this healthy product. It promotes an increased consumer demand at home --

EXT. SHIP LOADING DOCK (POSSIBLY WITH HOST)

As a freighter is loaded with containers of BC canned salmon.

HOST

-- and all over the world. The Canadian salmon canning industry is justifiably proud and confident of a standard of excellence second to none.

FADE OUT.