



David Huer

*Needle-in-the-haystack Business Investigator
Solving difficult, confusing, hard-to-grasp problems
Tenacious key-maker, unlocking butterfly effects*



Type	OWNING MY TASKS WORK IMPROVEMENT PROJECTS - BROKEN OUT STEP-BY-STEP
Industrial Process	SOLVING 6-YEAR-OLD FLAW - PRODUCT DESIGN FAILURE
<p>4.0 weeks</p> <p>Expertise + 2.0 weeks review + 2.0-minutes locating flaw</p> <p>Production Manager & Me: 2.0-weeks for root-cause</p>	<p>Preventing widespread damage to company brand</p> <p>After research, quickly locating flaw (½ cm stitch flaw). Co-tracing flaw back to 15-year-old error harming all product lines and assemblies. The root cause? Continuing to use inexpensive cardboard for product patterns after transition to profitability. It had become standard practice. Unearthing it helped us find a way to restore faith of a key customer.</p>
Expertise:	<p>Business Investigator/Analyst</p> <p>Tenacious key-maker, unlocking powerful competitive advantage Trusted for my ability to simultaneously look at all sides of complex problems</p>
Contact Information:	https://www.linkedin.com/in/davehuer/
Skills & Strengths	<ul style="list-style-type: none"> • Experienced in industrial design thinking • Solving difficult, seemingly "impossible" problems • Synthesizing and distilling vast constellations of the tiniest of clues • White Hat systems gamer, unlocking rippling butterfly effects • Developing authoritative terms, their distinctions, and definitions • Polymath domains-combiner: Researching, editing, reporting • Applying my skills as a solo, team, and embedded investigator

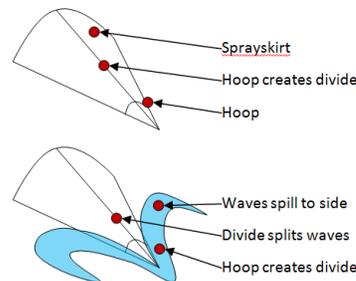
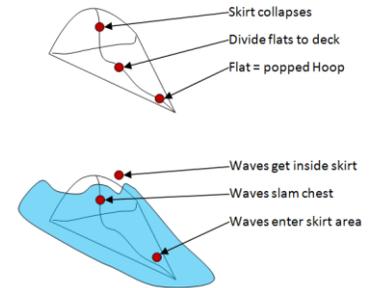
(A) SOLVING 6-YEAR-OLD FLAW - PRODUCT DESIGN FAILURETandem 40SP-01
Solo 40SP-02**Hoop Function**Sprayskirt
Hoop creates divide
HoopWaves spill to side
Divide splits waves
Hoop creates divide**Hoop Failure**Skirt collapses
Divide flats to deck
Flat = popped HoopWaves get inside skirt
Waves slam chest
Waves enter skirt area

Image:

CC0 Public Domain <https://pxhere.com/en/photo/820154>**Issue
My Activities**

A customer's life got endangered when he was alone in Arctic Scandinavia. After research, quickly locating source of flaw (1/2 cm stitch flaw).

We traced issue back to 15-year-old decision error harming all products. The decision? Cutting corners. Using cardboard for commercial patterns.

Customer Outcome

Dismayed expert customer's complaint validated.

Customer appreciated being validated and agreement to honour warranty.

Customer indicated intent to acknowledge this good service across Europe.

SCENARIO

A Canoe Spray Deck is a flat fabric cover that stretched tightly over the frame of the canoe. A Sprayskirt (#2) protects the paddler, and this is held in place with a plastic hoop held in place with two stitched pockets (starboard & port), inside the forward hemline abutting the deck. The Sprayskirt function is to create a "rising" hull, rising from the deck up to paddler's mid-chest; dividing oncoming waves to either side of the canoeist (not slamming into the chest of the paddler). The hoop creates the "point" of the split dividing an on-coming wave - holds up forward coaming to prevent collapse under the weight of water.

Complaint #1. A Deck had part failure while a European expert was on an Arctic solo expedition. The hoop popped out. The customer sent pictures but they did not reveal what the design flaw was. Solo paddling is a challenging pursuit. Solo *winter* paddling is only for highest-skill experts because of the risk of hypothermia and ice-buildup if water can pool and freeze solid in gaps and depressions in the Spray Deck. If a Sprayskirt fails to function as it has been designed, waves do not break to each side. Instead, they travel along the canoe up to the paddler's chest, and then heavy, freezing water pools at the waist.

Response #1

The Product Owner claimed there had never been a flaw before; refused to believe the customer's experience; internal discussions centred around the customer being wrong; and there were conflicting warranty instructions over several weeks tending towards a plan to void the warranty. In addition, there several languages in the conversation (English, German, Danish, French).

Complaint #2: The customer got upset at not being understood, at being called "wrong"; and warned us that this would get mentioned across Europe.

Response #2

In all fairness, there did not seem to be a flaw. When the Deck arrived back, no one with design authority could spot an issue--there did not seem to be flaw; and this was communicated to the customer who became upset again.

I was puzzled. Three senior managers were expert paddlers, we had an expert Head Seamstress, and I'm an expert paddler, also. Perhaps, as everyone thought, there was no issue—perhaps the customer made a fitting mistake?

MY ACTIVITIES

As Customer Service Coordinator, decided that this was a customer service/returns issue, and decided to take a look myself.

1) Review Issues

Comparing internal claims to social media claims

Social Media The company's reputation was harmed by failure to be up-front about quality issues. Despite what the customer got told, my enquiry uncovered social media/chat room complaints about hoops popping out for at least six years.

Expert customer upset If I could find that information, the expert customer could. No wonder he was frustrated. Our Product Owners didn't seem to comprehend that all companies attract social media chat about product.

Danger to reputation The company's reputation across Europe was at risk.

2) Inspect Product

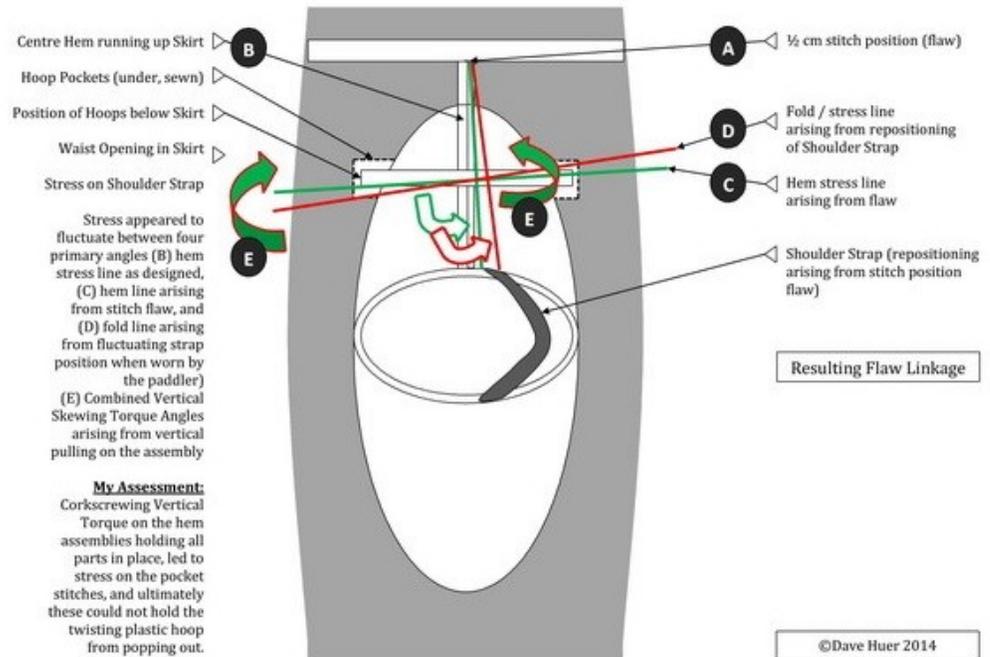
Inspecting product received back from customer

"Wearing" the Spray Skirt A Spray Deck is flexible and the customer complained that it didn't work in use. When the deck arrived back, I unrolled and laid it out, inspected it, re-inspected the photos of the alleged flaw, and then physically got onto the workbench, laid out the deck, and put the canoe deck on with my torso through the skirt; sitting inside the skirt hatch as if it was on the canoe. This had never been done.

Noticing the tiny clue As I knew the complaint details, and 'think in moving pictures', by moving my body and imagining fabric movement during the activity as if I was the customer using the deck, noticed while doing this that a ¼ cm fold was mis-aligned off the main fold in the centre of the skirt/hatch hem; producing a triple-reverse (5-bar linkage) chain of "pulls" that tugged out the hoop and traced this back to a stitch that was improperly offset ½ cm.

Finding flaw (2-minutes) The flaw is the ¼ cm off-stitch, producing a ½ cm sewing mis-alignment. The Skirt/Hatch Hem folds over at the foot of a zipper and velcroed flap along the skirt centerline. During production sequence, the off-stitch gets hidden under the Skirt/Hatch Hem. The line of the fold runs up into the shoulder strap and main skirt midriff hem. Following the fold, I determined that the line, being misaligned, reverse-pulls the Shoulder Strap and Skirt/Hatch hem out of alignment also. This chain of "pulls" pulled the hoop out of one foot pocket.

- a) Triple-reverse 5-bar linkage = complex flexible double-reverse 4-bar linkage web.
- b) Linkage could only be forensically discovered while the assembly was in use.
- c) Web node flows from ¼ cm fold misaligned off Main-Fold-Line in Skirt/Hatch Hem.
- d) Flow following Main-Fold-Line to the Shoulder Strap and Main-Skirt-Midriff-Hem.
- e) Misaligned Fold-Line pulls the hem--running up into shoulder strap--off alignment.
- f) Shoulder Strap reverse-torques (R-T) mis-stitched hem.
- g) Corkscrewing R-T motion forces the hoop against the hem stitch, which fails.
- h) Sprayskirt's forward fabric collapses to deck, letting waves hit paddler in the chest.



3) Reporting

Took observation forward to Production Manager (Prod.M), who stood beside me as I got back on the bench, got back into the sprayskirt, and led him through what I had observed. He inspected it again on his own, and then we reviewed it again, observing together that stitch placement was off.

Prod.M's review #1

We wondered if this was a systemic error? Prod.M and Head Seamstress determined that the error did not originate during production. Prod.M let me know and we brought this to the attention of the Product Owner.

#2

We were instructed to inspect the customer's Spray Deck using a canoe. We pulled a canoe, and fitted the deck, adjusting it to the placement used by customer using our fitting instructions and the body height of the customer. The hoop immediately popped out of one of the pockets.

#3

Prod.M traced flaw through to the Spray Deck pattern set. They were 6-years old. His analysis led to discovery that pattern's edges had degraded with creep over 6-year life of the pattern (fabric pencil = $\frac{1}{4}$ cm x 2 = $\frac{1}{2}$ cm).

#4

When starting out, the company saved money by making patterns from heavy cardboard. This had become engrained as standard practice. No one ever thought about changing this. But now we had a direct link between this practice and proof that this had literally endangered the customer's life.

#5

Product Owner directed Prod.M to test-stretch a newly-manufactured Spray Deck on the canoe. The hoop immediately popped, re-validating pattern creep as the root cause. Product Owner decided to redesign the Sprayskirt pattern and the interface between the Skirt and the Spray Deck assembly.

How Vetted:

- Company accepted that the flaw was a warranty issue.
- Company built a new deck for the customer.
- Company indicated that it would convert patterns to plastic.

Belief Level:

Customer was happy, promising to mention the good service across Europe.