Structure vs Speed:
Evaluating the Power Play
Neutral Zone Regroup
Decision in the AHL
Meet the Team!

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Executive Summary

1. Hockey-Graphs/Canucks Army Data Sprint
2. Acknowledgements
3. Background on the data
4. Even Strength VS Power Play
5. Definitions
6. Key Results
7. Limitations
Acknowledgements

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Thanks to WAR-ON-ICE.COM and Sam Ventura for the public plotting code
“Real data is sometimes available, rarely has the variables you need, and is never perfect”

-probably every sports analyst ever
Thank you to HockeyData for sponsoring the Data Sprint and for providing us with the data!

- 198 AHL Games between Oct 14th 2016 and Jan 28th 2017
- 14 Eastern Conference Teams
- Tagged Events (Shots, Blocked Shots, Missed Shots, Goals, Zone Entries/Exits, Hits, Turnovers etc.)
- 1343 unique 5 on 4 power plays from minor penalties
- 2217 minutes of power play time
Even Strength VS Power Play

Even Strength
- Not as concerned about time
  - Game situation dependent
- Offensive and defensive responsibilities
  - Possession highly contested

Power Play
- Limited duration
  - Maximize time in Offensive Zone
- More control of the play
  - Structured
Goals of Analyzing the Power Play

- Focus on structured elements of the Power Play
  - Can breaking structure lead to better results?
- Take advantage of the limited Power Play time
- Concentrate on zone entries
- Explore longer and controlled vs shorter and potentially riskier breakouts
Neutral Zone Regroup Decision

When the Power Play team recovers the puck in the Neutral Zone, Power Play teams must decide between

1. Immediately trying to re-enter the offensive zone
2. Bringing the puck back to their defensive zone to fully regroup and perform a structured offensive zone entry attempt
Immediate Zone Re-Entry
Immediate Zone Re-Entry

Benefits:
- Quicker, gain valuable seconds in offensive zone
- Catch Shorthanded team before or during shift change

Drawbacks:
- Less structure
- Higher risk of failing
- Less speed generated into the offensive zone
Full Regroup
Benefits:
- Structured, creates high quality chance on zone-entry
- Spreads defenders
- PP team can change lines

Drawbacks:
- Time consuming
- Lose pressure
- Shorthanded team can change lines
Neutral Zone Regroup Definition

A Neutral Zone Regroup begins when one of the following happens:

**Situation 1:**
- Previous tagged event was in the Offensive Zone
- Power Play team has possession in the Neutral Zone for the current event

**Situation 2:**
- Previous tagged event was in Neutral Zone, Short Handed team had possession
- Power Play team has possession in the Neutral Zone for the current event

This occurs 826 times in our data, about every three minutes of Power Play time
Immediate and Full Regroup Definitions

Immediate Regroup (n = 511)
We see a zone entry event attempt or Offensive Zone event before we see an event by the Power Play Team in the Defensive Zone

Full Regroup (n = 315)
We see an event by the Power Play Team in the Defensive Zone before we see a zone entry event attempt or an event in the Offensive Zone
How we define Expected Time and why?

Immediate Regroup Attempt

Initial Zone Entry Attempt

Puck Recovered in Neutral Zone

Full Regroup Attempt

Initial Zone Entry Attempt

Puck Recovered in Neutral Zone
How we define Expected Time and why?

Immediate Regroup Attempt

Full Regroup Attempt
How we define Expected Time and why?

- **Immediate Regroup Attempt**
  - Puck Recovered in Neutral Zone
  - Initial Zone Entry Attempt
  - Offensive Zone Entered
  - Offensive ZoneExited

- **Full Regroup Attempt**
  - Puck Recovered in Neutral Zone
  - Initial Zone Entry Attempt
  - Offensive Zone Entered
  - Offensive ZoneExited
Key Results
Expected Value Per Minute of PP Given Regroup Decision

- Shot Attempts
- Unblocked Shot Attempts
- Shots on Goal
- Goals

Regroup: Full, Immediate
Expected Value Per Minute of PP Given Regroup Decision

Team Level

ALB  BNG  BRI  HAR
Unblocked Shot Attempts

Shot Attempts

Shots on Goal

Goals

HER  LV  PRO  RCH

Unblocked Shot Attempts

Shot Attempts

Shots on Goal

Goals

SPR  STJ  SYR  TOR

Unblocked Shot Attempts

Shot Attempts

Shots on Goal

Goals

UTI  WIL

Unblocked Shot Attempts

Shot Attempts

Shots on Goal

Goals

Regroup  Full  Immediate
Expected Time

Immediate Re-Entry Attempt
Example

Full Regroup Attempt
Example

Offensive Zone
Exited
Average duration: 12.14 s

Offensive Zone
Exited
20.95 s

Average Time = 2.77 s

Initial Zone
Entry Attempt

Offensive Zone
Exited

Puck Recovered in Neutral Zone

Initial Zone
Entry Attempt

Offensive Zone
Entered

Puck Recovered in Neutral Zone

Average Time = 10.26 s

Average duration: 12.14 s
## Time Tradeoff

<table>
<thead>
<tr>
<th>Metric</th>
<th>Full</th>
<th>Immediate</th>
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</thead>
<tbody>
<tr>
<td>Offensive Zone Time</td>
<td>10.69</td>
<td>9.37</td>
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<tr>
<td>(seconds)</td>
<td></td>
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<tr>
<td>Regroup Time</td>
<td>10.26</td>
<td>2.77</td>
</tr>
<tr>
<td>(seconds)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Percentage of Expected Time Gained by Immediate Entry](chart.png)

- 73% of expected time gained
- -12% change in regroup time

**Stat:** Offensive Zone Time, Regroup Time
Takeaways - It’s not as risky as you think

Look to be more Aggressive
- Time to regroup and start new breakout for a full regroup is not worth it

Take Context Into Account
- Context on the ice is more important than numbers
- Tired players stuck on the powerplay is not ideal
- Full regroup still has benefits
- Offsides should be avoided

Manage the Team
- Individual teams may be more skilled in immediate or full zone regroup
- More research can help make this decision in the future
Limitations

1. Data Definitions that represent the problem correctly

2. Tagged data inherently misses out on time as it is not continuous
Future Work

1. Gather more data for more reliable estimates
2. Shift changes punished
3. Apply methodology to NHL
4. Gain Coaches, Players and Other Analytic Perspectives
Any questions?

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